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**Improving Corporate Value through Disaster Management:  
Prospects of Socially Responsible Investment (SRI)  
for Disaster Reduction**

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**Economic and Industrial Research Department  
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# Improving Corporate Value through Disaster Management: Prospects of Socially Responsible Investment (SRI) for Disaster Reduction

## Summary

1. Japan is prone to various natural disasters including earthquakes, tsunamis, typhoons and volcanic eruptions. Great damage has been caused recently by windstorms, floods and earthquakes, including the torrential rain in Niigata and Fukui and the Niigata-Chuetsu earthquake last year. With the imminent threat of major earthquakes in the Tokai region as well as in the Pacific to the southeast and south of the archipelago, disaster reduction is now a top priority in Japan. Disaster reduction efforts may be addressed from three perspectives: time (prevention, disaster response and recovery/rehabilitation), space (global/national level, area level and zone/grid square level) and actors (public sector and private sector). In terms of actors, such efforts may be classified into self-help, mutual aid and public assistance. Self-help and mutual aid efforts are becoming increasingly important as public assistance is constrained due to tight budgets in central and local governments. Under these circumstances, businesses are now expected to play a leading role in building safe and secure communities by working with other companies, local residents and the government. As international competition intensifies, however, companies are narrowing the focus of investment through selection and concentration, while curtailing costs to improve business efficiency. Thus, they are reluctant to invest actively in disaster reduction efforts, which do not produce any tangible short-term effects.

2. Legislative and other regulatory measures are not sufficient to improve the resilience of corporations against natural disasters. It is imperative to evaluate properly corporate efforts for disaster reduction, thereby creating an enabling environment for voluntary and strategic approaches to disaster reduction. In so doing, the following measures may be considered:

- (1) Companies should provide for disaster reduction investments as part of risk management and prepare a strategic Business Continuity Plan (BCP) to help return to normality without undue business disruption in case of a contingency. This should be followed by risk financing to implement the BCP, the promotion of cooperation with the local community, and the disclosure of corporate disaster reduction efforts in a specific account or report.
- (2) Building on the measures described in (1) above, a mechanism should be created to ensure social recognition of those companies making appropriate efforts for disaster reduction (e.g. disaster rating of companies and socially responsible investment for disaster reduction).
- (3) Corporate activities for disaster reduction should be expanded and promoted to provide a wide range of relevant products and services.

3. There has been heightened interest in the BCP since the 9/11 terrorist attacks in the United States. The significance of the BCP has been increasingly recognized in such previously overlooked areas as operating loss and impact on local employment. From the standpoint of a company, preparation of a BCP will ultimately improve corporate value by winning the confidence of customers and discharging corporate social responsibility in cooperation with the local community. Some call for Japanese companies to conduct BCP awareness-raising activities, as they lag behind their European and American counterparts in business continuity planning. However, a BCP on paper alone is unlikely to actually improve corporate resilience against natural disasters. Steady progress in the preparation of a highly effective Japanese version of BCP is needed, drawing on the disaster-related expertise accumulated thus far in individual companies.

4. Also, proper evaluation of the BCP and other comprehensive corporate efforts for disaster reduction (disaster management) is required for promoting such efforts. Some indicators have been developed to evaluate existing corporate disaster reduction efforts, building on the guidelines provided by the U.S. Federal Emergency Management Agency (FEMA). Some indicators evaluate overall corporate risks, while others, including those published by the Fire Defense Agency, concern the disaster resilience of communities. Recently, the Cabinet Office also announced that it would prepare indicators to measure corporate resilience against natural disasters. Introduction of any disaster rating will have to address issues such as (1) the formation of social consensus, (2) divergence between the indicators and actual conditions, and (3) the development of proper, harmonized indicators.

Based on those considerations, a technique may be proposed to evaluate comprehensively the functioning of a PDCA (plan-do-check-action) cycle at each of the prevention, disaster response, and recovery stages.

5. Traditionally, business management and evaluation thereof focused primarily on financial indicators. In recent years, however, experiments on various approaches have been conducted to examine corporate management from the long-term viewpoint, including CSR, risk management and intellectual capital. In Japan, any risk management should consider earthquakes and other natural disasters, as they have huge impact on business management. Nonetheless, corporate response has been insufficient largely due to the unpredictability of natural disasters and the difficulty in making assumptions on possible damages. Although companies are willing to take measures against natural disasters, they have found it difficult to establish a proper internal decision-making process due to the lack of specific criteria, making it impossible to clarify to the stakeholders the positive effects of disaster reduction efforts. Disaster accounting and the

disclosure of disaster reduction efforts ensure steady improvement in corporate disaster resilience and enable efficient business management by analyzing the cost-effectiveness of disaster protection investments. Such measures may also increase corporate value by providing the stakeholders with quantitative and qualitative explanations of disaster reduction efforts. Nevertheless, some issues remain regarding disaster accounting and similar practices:

- (1) Companies have to bear additional costs as disaster data are largely underdeveloped.
- (2) Appropriate indicators need to be developed to measure the effect of disaster reduction investments.

Actually, some companies disclose costs and investments for disaster reduction in their sustainability reports, along with descriptions of relevant efforts.

As discussion on corporate social responsibility heats up, the significance of efforts for disaster reduction needs to be clearly understood in conjunction with the triple bottom lines of economy, environment and society. Starting in the environmental field, socially responsible investment (SRI) in Japan has expanded to sociality areas. Although it remains far below the scale of Europe and the U.S., SRI in Japan is expected to increase in the years ahead as interest in corporate social responsibility grows. In this context, the introduction of SRI for disaster reduction will have to be considered for assessing corporate management in terms of disaster resilience, as well as environmental soundness and sociality. Most importantly, Japanese companies will be able to erase their concerns about the future risks of earthquakes and other natural disasters by advocating the adoption of SRI for disaster reduction as a global standard.

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## Introduction

Japan is prone to various kinds of natural disaster including earthquakes, tsunamis, typhoons and volcanic eruptions. Indeed, Munich Re recently stirred controversy both in Japan and overseas with its announcement that Japan, specifically Tokyo and Yokohama, has by far the highest risk of natural disaster among major cities in the world. Frequent damages have been caused recently by windstorms, floods and earthquakes, including the torrential rains in Niigata and Fukui and the Niigata-Chuetsu earthquake last year. With the imminent danger of major earthquakes in the Tokai region as well as in the Pacific to the southeast (Tonankai) and south (Nankai) of the archipelago, disaster reduction is a top priority in Japan. Disaster reduction efforts may be classified into self-help, mutual aid and public assistance. Self-help and mutual aid efforts are becoming increasingly important as public assistance is constrained by budget difficulties in central and local governments. In particular, businesses are now expected to play a leading role in

building safe and secure communities by working with other companies, local residents and the government. As international competition intensifies, however, companies are narrowing the focus of investment through selection and concentration, while curtailing costs to improve efficiency. Thus, they are reluctant to invest actively in disaster reduction efforts which do not produce any benefits in the short term.

Under these circumstances, legislative and other regulatory measures are not sufficient to make corporations better able to withstand natural disasters. Thus, one effective approach would be to ensure that corporate efforts for disaster reduction are properly recognized, thereby creating an environment that encourages voluntary and strategic disaster reduction efforts.

In light of the recent increase in the importance of the Business Continuity Plan (BCP), this report examines the current status of planning and identifies challenges for its diffusion. It also explores ways to ensure that integrated efforts for disaster reduction (disaster management) will add value to corporations.

### Natural Disaster Risk Index for the World's Major Cities

City	Risk index	City	Risk index
Tokyo/Yokohama	710.0	Sydney	6.0
San Francisco	167.0	Santiago	4.9
Los Angeles	100.0	Istanbul	4.8
Osaka/Kobe/Kyoto	92.0	Buenos Aires	4.2
New York	42.0	Johannesburg	3.9
Hong Kong	41.0	Jakarta	3.6
London	30.0	Singapore	3.5
Paris	25.0	Sao Paulo	2.5
Mexico City	19.0	Rio de Janeiro	1.8
Beijing	15.0	Cairo	1.8
Seoul	15.0	Delhi	1.5
Moscow	11.0		

Source: Compiled by Cabinet Office based on Munich Re Annual Report.

# I Overview of Natural Disaster Conditions in Japan

## 1. Natural Disasters in Recent Years

Major natural disasters in recent years include the Great Hanshin-Awaji Earthquake in 1995, which killed more than 6,000 people, the northern Miyagi earthquakes and the Tokachi-Oki earthquake in 2003, as well as the Niigata-Chuetsu earthquake in 2004. The numerous major earthquakes in the past caused substantial casualties and property damages. Windstorms and torrential rains have also caused major damages, including Typhoon Etau in August 2003, with 19 people killed or missing nationwide, as well as the torrential rains in Niigata/Fukushima and Fukui in July 2004, with 16 and 4 people killed or missing respectively. Flood damages in recent years are too numerous to list, as the year 2004 saw a record number of typhoons landing in Japan (10). Damages caused by natural disasters including earthquakes and floods are outlined in Tables 1-1 and 1-2.

The Niigata-Chuetsu earthquake in October 2004 almost equaled the Great Hanshin-Awaji Earthquake in scale, with a magnitude of 6.8 and the maximum shindo (typical Japanese measure) of 7. Despite killing 40 people and damaging

over 130,000 buildings and houses (as of 29 December 2004, Table 1-3), the earthquake caused relatively few casualties and property damages for its scale, as it hit a mountainous rural area where the population density is lower than in the Kobe area and houses are solidly built to withstand heavy snowfall in winter. Nonetheless, the amount of damage totaled ¥3 trillion, almost one third of the loss inflicted by the Great Hanshin-Awaji Earthquake (¥10 trillion).

The economic loss was also substantial as the Chuetsu area is home to various industries related to automobiles and semiconductors, local industries including sake manufacture, as well as agriculture, forestry and fishery activities such as paddy rice growing, and carp aquaculture. Of the total loss of ¥3 trillion, commerce and industry reportedly account for ¥300 billion, with agriculture, forestry and fishery representing another ¥400 billion.

Table 1-4 shows the result of an on-site survey conducted by the Niigata Department of Industry and Labor concerning the operation of 217 major local enterprises. Only 71% of the companies were able to return to the previous level of operation three weeks after the earthquake, thus implying that the interruption of business had a considerable impact on the local economy and employment.<sup>1</sup>

**Table 1-1. Damages Caused by Natural Disasters in Recent Years**

	Casualties (persons)				Property damage (building units)						Total amount of damage (¥ million)	
	Killed	Missing	Injured		Housing				Non-housing			
			Heavily	Lightly	Total collapse	Half collapse	Partially damaged	Flooded above floor	Flooded below floor	Public buildings		Others
1999	137	4	304	1,394	531	3,844	113,074	14,950	68,562		26,750	950,449
2000	76	2	187	618	621	3,696	21,501	25,506	59,722		4,107	604,909
2001	87	3	455	835	156	1,155	51,707	3,031	14,074	370	1,180	436,081
2002	47	1	136	343	74	259	5,455	3,514	14,852	248	4,276	365,021
2003	58	4	292	1,904	1,509	4,437	18,342	5,519	13,198	331	10,015	599,082

*Notes:* 1. Figures represent damages caused by windstorms, torrential rains, floods, tidal waves, earthquakes, tsunamis, volcanic eruptions or other abnormal natural phenomena.

2. Non-housing property damage has been classified into "public buildings" and "others" since 2001.

*Source:* White Paper on Disaster Management, various years.

<sup>1</sup> For more information, see DBJ, "Immediate Report: Impact of the Niigata-Chuetsu Earthquake on Prefectural Economy."

**Table 1-2. Major Earthquakes in Recent Years**

Date	Name	Magnitude	Total collapse (building units)	No. of people killed
15/1/93	Kushiro-Oki	7.5	53	2
12/7/93	Southwest off Hokkaido	7.8	601	202 28 missing
12/10/93	Far off Tokaido	6.9		1
4/10/94	East off Hokkaido	8.2	61	
28/12/94	Far off Sanriku	7.6	72	3
17/1/95	Hyogo-ken Nanbu	7.3	104,906	6,433 3 missing
1/7/00	Centered near Niijima and Kozushima	6.5	15	1
6/10/00	Tottori-ken Seibu	7.3	435	
24/3/01	Geiyo	6.7		2
26/5/03	Centered off Miyagi Prefecture	7.1	2	
26/7/03	Centered on northern Miyagi Prefecture	6.4	1,270	
26/9/03	Tokachi-Oki	8.0	101	2 missing
23/10/04	Niigata-Chuetsu	6.8	2,860	40

*Note:* The numbers of totally collapsed buildings and persons killed are based on the announcement of the Niigata Prefecture Emergency Taskforce Headquarters as at 29 December 2004.

*Source:* White Paper on Disaster Management, 2004.

**Table 1-3. Damages Caused by 2004 Niigata-Chuetsu Earthquake**

	Casualties (persons)			Housing (building units)				Non-housing (building units)	Other damages (no. of sites)		
	Killed	Missing	Injured	Total collapse	Major collapse	Half collapse	Partially damaged	Public facilities + others	Roads	Rivers	Landslides
Niigata Pref. total (15 cities, 31 towns, 14 villages)	40	0	4,559	2,860	1,663	9,341	89,381	34,899	6,062	229	442

*Source:* Announcement by Niigata Prefecture Emergency Taskforce Headquarters as at 29 December 2004.

**Table 1-4. Recovery of Manufacturing Operations After Niigata-Chuetsu Earthquake**

Operating rate	0%	Under 50%	Under 70%	Under 100%	100%
4 November	24 11%	19 9%	21 10%	48 22%	105 48%
15 November	2 1%	7 3%	15 7%	38 18%	154 71%

*Source:* Industry and Labor Department, Niigata Prefecture.

## 2. Major Risks of Earthquake

(i) Tokai, Tonankai and Nankai Earthquakes  
Earthquakes may be classified into those occurring inside a plate and those occurring along an oceanic trench which forms a plate boundary. The former type includes the Niigata-Chuetsu and Great Hanshin-Awaji earthquakes while the latter type includes the Great Kanto Earthquake.

A trench-based earthquake occurs when the distortion caused by the interaction of two plates reaches a critical limit. This type of earthquake may cause tsunamis if its epicenter is located under the ocean. It may cause substantial damages over a vast area, with many people being crushed to death under collapsed buildings. Meanwhile, an earthquake on a plate occurs when the distortion inside a plate caused by the movement at a plate boundary reaches a critical

limit. Despite discharging less energy than a trench-based earthquake, it may cause substantial local damages if its epicenter is located under a densely populated area.

Among the possible trench-based earthquakes, disaster reduction efforts are progressing rapidly against the Tokai, Tonankai and Nankai earthquakes due to their imminence, the potentially wide area affected and the scale of economic loss. The governmental Earthquake Research Committee predicts that the Tokai earthquake will occur sometime in the next 30 years with a probability of 84%.<sup>2</sup> The probability is about 60% for the Tonankai earthquake, whose epicenter will be near that of the Tokai earthquake, and around 50% for the Nankai earthquake (Table 1-5).

The Tokai and Nankai areas have been the epicenter of a major earthquake with magnitude

**Table 1-5. Probabilities of Major Earthquakes (within 30 years)**

Epicenter	Magnitude		Probability			Expected damages
			In 10 yrs.	In 30 yrs.	In 50 yrs.	
Off Etorofu island	+/-8.1		8-10%	+/-50%	80-90%	-
South off Sanriku near trench	+/-7.7	Coincidence +/-8.0	30-40%	70-80%	90+%	Coincidence (in Iwate Pref.) 1,014 killed <sup>*3</sup>
Off Miyagi Prefecture	+/-7.5		+/-50%	99%	-	Coincidence (in Miyagi Pref.) 164 killed <sup>*4</sup>
Tokyo inland <sup>*1</sup> (other earthquakes of magnitude 7 or over in southern Kanto)	6.7-7.2		+/-30%	+/-70%	+/-90%	12,000 killed <sup>*5</sup> ¥112 trillion lost <sup>*6</sup>
Tonankai	+/-8.1	Coincidence +/-8.5	10-20%	+/-60%	+/-90%	Coincidence 25,000 killed <sup>*7</sup> ¥81 trillion lost
Nankai	+/-8.4		+/-10%	+/-50%	+/-80%	
Tokai <sup>*2</sup>	+/-8		-	84%	-	

*Note:* Compiled by DBJ from Earthquake Research Committee, "List of Long-term Evaluation of Active Faults and Trench-Type Earthquakes" (12 January 2005) for the major earthquakes with a probability of 50% or over within the next 30 years. For more information, see Earthquake Research Committee website (<http://www.jishin.go.jp/main/>).

\*1 Earthquakes other than Taisho- and Genroku-types of Kanto earthquake.

\*2 The magnitude and probability of the Tokai earthquake used in the probabilistic seismic hazard map for western Japan.

\*3 Iwate Prefectural Government Report on Earthquake/Tsunami Simulation and Damage Assumption Survey (November 2004).

\*4 Miyagi Prefectural Government Report on Earthquake Damage Assumption Survey (March 2004).

\*5 Central Disaster Management Council, "Special Board of Inquiry concerning Earthquakes Centered Directly under Tokyo" (published in December 2004).

\*6 Central Disaster Management Council, "Special Board of Inquiry on Measures concerning Earthquakes Centered Directly under Tokyo" (published in February 2005).

\*7 Central Disaster Management Council, "Special Board of Inquiry on the Tonankai and Nankai Earthquakes," (published in September 2003).

<sup>2</sup> The figure, which was used in the probabilistic seismic hazard map for western Japan, has a lower reliability than the probabilities of other oceanic-trench earthquakes.

7 or over approximately once in every 100-150 years, including the Keicho (1605), Hoei (1707), Ansei-Tokai/Ansei-Nankai (1854), Tonankai (1944) and Nankai (1946) earthquakes. The three epicenter areas of Tokai, Tonankai and Nankai were simultaneously destroyed by the Keicho, Hoei and Ansei-Tokai/Ansei-Nankai earthquakes. Moreover, the Nankai earthquake came only two years after the Tonankai earthquake. This history suggests that the distortion at the plate boundary is dangerously near the critical limit. It is likely that two or more earthquakes will happen at the same time, probably triggered by the Tokai earthquake, which may strike at any time. According to the Special Board of Inquiry on the Tonankai and Nankai Earthquakes, the coincidence of the Tonankai, Nankai and Tokai earthquakes could cause up to 25,000 deaths, the total collapse of some 940,000 buildings and an economic loss of some ¥81 trillion.

The Special Measures Law on Earthquake Disaster Prevention was enacted in 1978. More than 20 years on, the Government created in March 2001 a Special Board of Inquiry on the Tokai Earthquake under the Central Disaster Management Council to improve preparedness for the imminent Tokai earthquake. This was followed by the establishment in March 2002 of a Special Board to Prepare for the Tokai Earthquake. The risk of the Tonankai and Nankai earthquakes was also discussed when setting up the Special Board, effectively leading to the decision of the Central Disaster Management Council in June 2001 to establish a similar Special Board on the Tonankai and Nankai Earthquakes. In May 2003, the Government presented the General Guidelines on Tokai Earthquake Preparedness at a meeting of the Central Disaster Management Council, followed by the preparation of similar guidelines for the Tonankai and Nankai earthquakes in December. In April 2002, 263 communities in eight prefectures were designated as Enhanced Earthquake Preparedness Regions Related to the Tokai Earthquake. In December 2003, 652 communities in 21 prefectures were designated as Enhanced Tonankai and Nankai Earthquake Preparedness Regions, as they were considered to be highly vulnerable to a major earthquake.

## Background Information

The Japan Meteorological Agency (JMA) announces a Tokai Earthquake Observation Report, Tokai Earthquake Advisory or Tokai Earthquake Warning when it has detected any anomaly that may be related to the Tokai earthquake. When a Tokai Earthquake Observation Report is issued, residents should live as usual, taking necessary measures according to the content of the information. A Tokai Earthquake Advisory is issued when the anomaly is likely to be a precursor to the Tokai earthquake. In this case, agencies related to disaster reduction bring necessary staff together and secure an emergency communication system. Any requirement for preparatory action in the Government will be made public, including the establishment of a Prime Minister task force, the dispatch of an advance team for gathering information, preparation for the dispatch of emergency, rescue and firefighting teams, supply checks, as well as proactive measures for traffic control.

A further anomaly will trigger the JMA to convene the Earthquake Assessment Committee (EAC) for the Areas under the Tokai Earthquake, a personal advisory panel for the Secretary-General of the JMA. A Tokai Earthquake Warning will be reported to the Prime Minister, who in turn will issue a warning declaration after a Cabinet meeting. This will lead to immediate establishment of earthquake disaster prevention headquarters and local disaster prevention headquarters, each of which will ensure necessary coordination to initiate emergency response measures against earthquake disaster. In addition, emergency, rescue and firefighting teams will be dispatched to the warning area as necessary, preparations will be made for immediate dispatch of first-aid teams, and necessary traffic controls will be implemented to ensure the loading of supplies to relief vehicles and the availability of area-wide transportation routes. When a disaster does happen, local emergency headquarters will be established.<sup>3</sup>

<sup>3</sup> White Paper on Disaster Management, 2004.

(ii) Inland Earthquake in Tokyo Metropolitan Area

The southern Kanto region has been hit by an earthquake comparable to the Great Kanto Earthquake (magnitude of 8 or over) once in every 200 to 300 years, with several major inland earthquakes (magnitude of 7 or over) in between.

According to the Earthquake Research Committee of the Headquarters for Earthquake Research Promotion, the probability of another Great Kanto Earthquake is 0.9% for the next 30 years, but a major inland earthquake with a magnitude of seven or over is expected to occur in the meantime with a probability of 70%.

Within the Government, the Central Disaster Management Council adopted the Outline of Disaster Response Measures against the Southern Kanto Earthquake in December 1988, and the General Guidelines on Preparedness for Inland Earthquakes in Southern Kanto in August 1992, both of which were revised in June 1998. In addition, a Special Board of Inquiry on Measures concerning Earthquakes Centered Directly under Tokyo was established in September 2003 under the Council. In December 2004, the Special Board announced that an inland earthquake in the Tokyo metropolitan area<sup>4</sup> could kill up to 120,000 people<sup>5</sup> (64% of whom would be killed by fire), totally destroy some 850,000 buildings (77% of which would be destroyed by fire) and prevent up to 6.5 million people from returning home. This was followed in February 2005 by another announcement that economic damage may reach ¥112 trillion, almost ten times as large as that caused by the Great Hanshin-Awaji Earthquake. It has been identified that an earthquake at any of the 18 possible epicenters will

cause much of the property damages and casualties by fire, demonstrating once again that concentrations of wooden houses pose major challenges for disaster reduction in the metropolitan area. Also, an inland earthquake might cause substantial economic disruption in the area, where the headquarters of many large companies are located.

(iii) Future Direction

Thus, expected damages have now been quantified for major earthquakes including the Tonankai, Nankai and Tokyo inland earthquakes, as well as the highly imminent Tokai earthquake. Looking ahead, a national strategy will be established to address disaster risks, and disaster reduction efforts will continue among central government agencies and local authorities. Concrete measures include the reinforcement of buildings against earthquakes (including preventing the collapse of concrete walls), measures to arrest the spread of fire (promotion of fireproof construction), the designation of evacuation sites (facilities to be opened in case of disaster), the designation of escape routes for evacuees and the development of banks and breakwaters.

However, the government alone will not be able to cope with the Tokai and other major earthquakes in terms of financial and human resources, as substantial damages will extend to a vast area. Also in light of the inclusion of many “self-defense” and “self-help” elements in the disaster reduction measures, businesses and local communities will be unable to totally rely on government efforts and subsidies, and will have to participate actively themselves.

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<sup>4</sup> Here, an inland earthquake of magnitude 7 or over is assumed (with any of the 18 possible epicenters in the Kanto region), and not an earthquake comparable to the Great Kanto Earthquake, which strikes once in every 200-300 years.

<sup>5</sup> The figure was revised upwards to 13,000 in February 2005.

## II Improving Corporate Disaster Preparedness through Market Forces

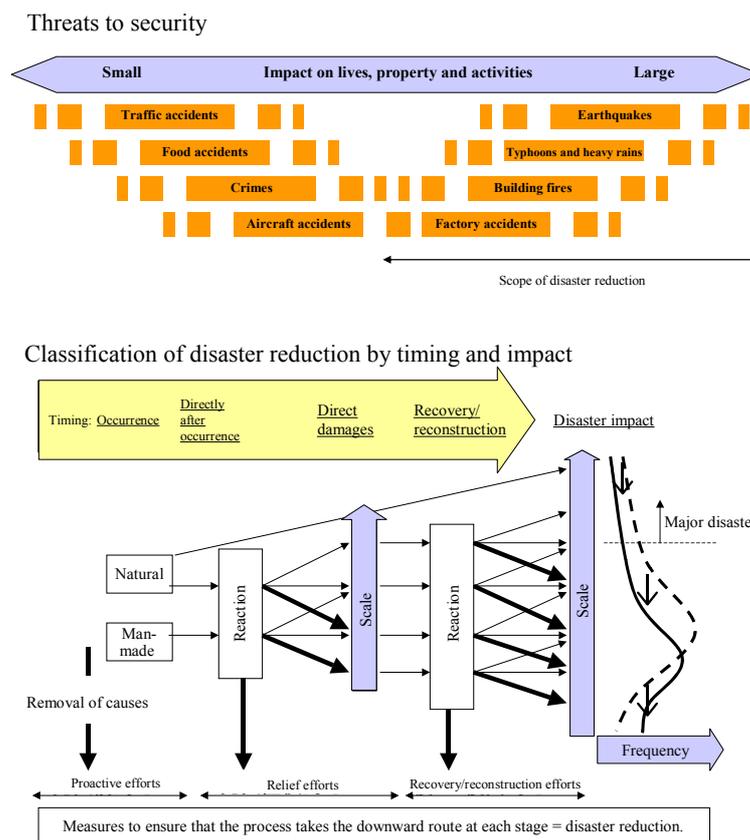
### 1. Framework for Disaster Reduction

#### 1.1. What is Disaster Reduction?

This section reviews the framework for disaster reduction. Threats to security come not only from natural disasters such as earthquakes, typhoons and tsunamis, but also from human negligence such as traffic accidents, building fires, falling masonry, radioactive pollution, plane crashes and oil spills, and even from deliberate acts such as murder, robbery, terrorism and war. In this report, “disaster reduction” refers to measures against unintended threats that may cause widespread damage, and this chapter considers disaster reduction efforts in this context.

The primary objective of disaster reduction is to protect lives, property and economic/social activities against disasters. Disaster reduction efforts may be classified according to their objective (emphasis on saving lives, property or economic/social activities), the cause of disaster (earthquake, typhoon/torrential rain, building fire or factory accident), timing of the efforts (prevention, emergency measures or recovery/reconstruction), scope (global/national level, area level or zone/grid square level) and primary actor (public sector or private sector including businesses). Current disaster reduction efforts need to be realigned along these axes to address any gaps or bottlenecks. For example, Figure 2-1 classifies disaster reduction according to timing and impact.

On the horizontal axis time is divided into the occurrence of the disaster, the period directly after the disaster and the recovery/reconstruction



Source: DBJ Policy Planning Note No. 9, “Disaster Reduction: What is Needed for a Safe Society?”

Figure 2-1. Concept of Disaster Reduction

period. The vertical axis indicates the scale of the disaster and its impact: the damage is greater higher up the axis.

Disasters are classified into natural disasters and man-made disasters. Proactive disaster reduction efforts in the pre-occurrence stage should be focused on removing the causes of man-made disasters. The damage may be eliminated (the thick downward arrow) or controlled (the thick arrow toward the lower right) through relief efforts directly after the occurrence. Any mismanagement will increase the scale of the disaster (the thin arrow toward the upper right). Reduction of the damage also depends on the success of recovery/reconstruction efforts.

The rightmost curve represents the typical distribution of ultimate disaster scales. The objective of disaster reduction is to reduce the frequency of major disasters and the extent of damages by shifting the distribution downwards and altering the shape of the distribution curve through appropriate proactive, emergency and recovery/reconstruction measures.

## 1.2. Classification of Frameworks

Table 2-1 classifies the frameworks for disaster reduction by timing, scope and actor. By timing, disaster reduction is classified into the frameworks of proactive, relief and recovery/reconstruction efforts. By scope, it may be classified into the global/national level, area level and zone/grid square level. At the global/national level, disasters have taken on a new dimension in recent years. In 1999, semiconductor prices rose rapidly in world markets after a major earthquake in Taiwan, the principal supplier of semiconductors to the world. In Japan, many plants account for substantial shares in the global supply of their respective products. The impact of a shutdown of these production facilities due to a disaster would spread well beyond the scope of the direct damage. As an example, the supply of brake parts for Toyota was stopped by a fire at the plant of Aisin Seiki in 1997, causing substantial secondary

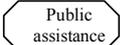
damage. As such cases illustrate, businesses need to consider risks from a BCP standpoint and to diversify supply plants to prevent a disaster from causing further damage.

At the area level, any damage to core local enterprises may have grave consequences for the local economy. One way to identify the potential impact of a disaster on the local economy is to build a database on the geographical distribution of production sites in Japan. A comprehensive regime for the collection, communication and analysis of security information, including the integrated Geographic Information System (GIS), would also make a difference.

At the zone/grid square level, the importance of communities has been recognized. For example, it was citizens themselves who eventually saved the most lives after the Great Hanshin-Awaji Earthquake. While citizens pulled out tens of thousands of people buried alive, the Self Defense Force, fire service and police reportedly saved about only 5,000 people in total, although the difference in difficulty of life-saving efforts must be considered. Looking ahead, local authorities, businesses and nonprofit organizations (NPOs) will be required to work together for improving the disaster preparedness of communities.

Actors are largely classified into the public sector and the private sector (including businesses). The public sector prepares disaster reduction plans and seeks to improve the quake resistance of structures. It also plays a central role in emergency response and recovery/reconstruction efforts. The private sector, on the other hand, prepares for possible disasters and works with the public sector in relief efforts when a disaster does strike. The private sector will be required to lead voluntary disaster reduction efforts, as the public sector alone cannot be relied on to cope with a major disaster. This report focuses on how to improve the disaster preparedness of the private sector (including businesses).

**Table 2-1. Classification of Disaster Reduction Efforts**

		Proactive measures	Emergency measures	Recovery/reconstruction
By timing		<ul style="list-style-type: none"> <li>○ Identify emergencies to be dealt with.</li> <li>○ Remove causes of (man-made) disasters.</li> <li>○ Minimize damages from disasters (proactive measures).</li> <li>○ Most effective disaster reduction measures within financial constraints and environmental considerations.</li> </ul>	<ul style="list-style-type: none"> <li>○ Specify/prioritize emergencies to be dealt with.</li> <li>○ Prevent damages from spreading.</li> <li>○ Respond to unexpected events.</li> <li>○ Prevent post-disaster disorder.</li> <li>○ Prevent economic disruption.</li> </ul>	<ul style="list-style-type: none"> <li>○ Prevent indirect impact from spreading.</li> <li>○ Recover physical situation.</li> <li>○ Recover economic and social situation (better functions may be required than before).</li> </ul>
By scope	Global/national level	Serious damage to a domestic plant affects domestic and overseas production. 	<ul style="list-style-type: none"> <li>• Diversify plants.</li> </ul>	(Globalization)
	Area level	Serious damage to local businesses substantially affects the local economy. 	<ul style="list-style-type: none"> <li>• Utilize GIS (Geographic Information system).</li> <li>• Create local industry disaster reduction database (disaster reduction map).</li> </ul>	(Information)
	Zone/grid square level	<ul style="list-style-type: none"> <li>• Buildings that only satisfy old quakeproof standards.</li> <li>• Renew urban concentrations of wooden buildings.</li> </ul> 	<ul style="list-style-type: none"> <li>• Community/business cooperation</li> <li>• Business cooperation</li> <li>• Community cooperation</li> </ul>	 (Community)
By actor	<p>Public sector</p>    <p>Mutual aid</p>  <p>Private sector (businesses)</p>	<ul style="list-style-type: none"> <li>• Prepare disaster reduction plan.</li> <li>• Proactive measures on land management, living, industry and logistics as well as their interaction through appropriate utilization of forecast information.</li> </ul>	<ul style="list-style-type: none"> <li>• Coordinate volunteer efforts and manage funds and relief aid.</li> <li>• Delegate authority and ensure cooperation between organizations.</li> </ul>	<ul style="list-style-type: none"> <li>• Recovery/reconstruction plan</li> <li>• Proper resource allocation (prioritizing)</li> <li>• Financial assistance and tax relief</li> <li>• Emergency credit</li> </ul>
		<ul style="list-style-type: none"> <li>• Lifecycle management of structures</li> <li>• Failsafe measures</li> <li>• Repair and reinforce structures (measures commensurate with the amount of risks, effective use of existing stocks).</li> </ul>	<ul style="list-style-type: none"> <li>• Rescue, check the spread of fire.</li> <li>• Prevent secondary disasters.</li> </ul>	<ul style="list-style-type: none"> <li>• Repair and renewal, reinforcement of new buildings</li> </ul>
		<ul style="list-style-type: none"> <li>• Prepare disaster reduction manual/BCP.</li> <li>• Disaster forecast/simulation</li> <li>• Physical reinforcement of structures</li> <li>• Physical diversification: correct excessive concentration and ensure backup.</li> <li>• Disaster accounting</li> <li>• Disaster reduction business</li> </ul>	<ul style="list-style-type: none"> <li>• Evacuation/relief, information, resource input (prioritization)</li> <li>• Avoid disruptions in industry, logistics and finance.</li> <li>• Evacuation drills</li> </ul>	<ul style="list-style-type: none"> <li>• Implement BCP.</li> <li>• Backup offices.</li> <li>• Repair and renewal</li> <li>• Utilization of financial contracts</li> </ul>

Source: DBJ Policy Planning Note No. 9, “Disaster Reduction: What is Needed for a Safe Society?” partially revised.

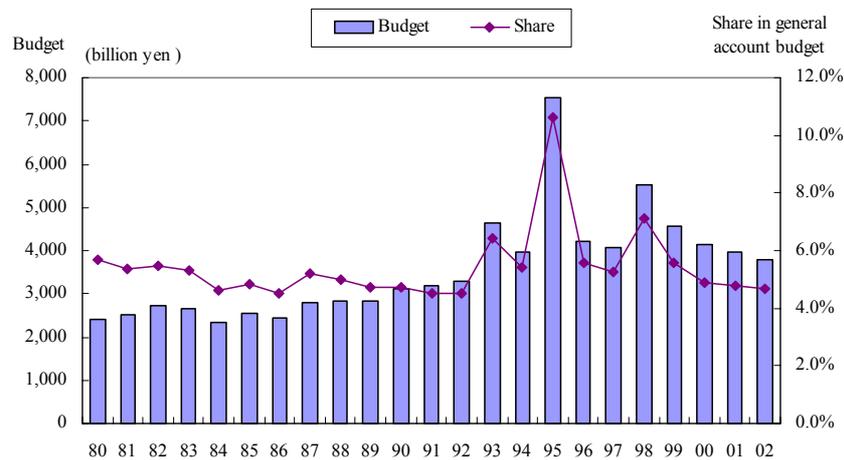
## 2. Why Market Forces?

As mentioned earlier, disaster reduction efforts comprise self-help, mutual aid and public assistance. The scope of public assistance is constrained by the tight budgets of national and local governments (Figure 2-2). Thus, businesses are increasingly required to prepare themselves for possible disasters through self-help and mutual aid.

According to a survey of the Commercial Property Research Institute, about one third of office buildings in the Tokyo metropolitan area were constructed under the old quakeproof standard, which is now deemed insufficient. Although the Government has been encouraging upgrading them to fully quake-resistant buildings under the Law on the Promotion of Quakeproof Repairs, reinforcement works have made little progress, largely because the law does not have any enforcement clause. Thus, government regulations cannot be relied upon for improving disaster preparedness. One effective solution would be to create an enabling environment for businesses to commit themselves to voluntary and strategic improvement of disaster preparedness by utilizing market forces for properly evaluating corporate disaster reduction efforts (Figure 2-3). Concrete measures include the following.

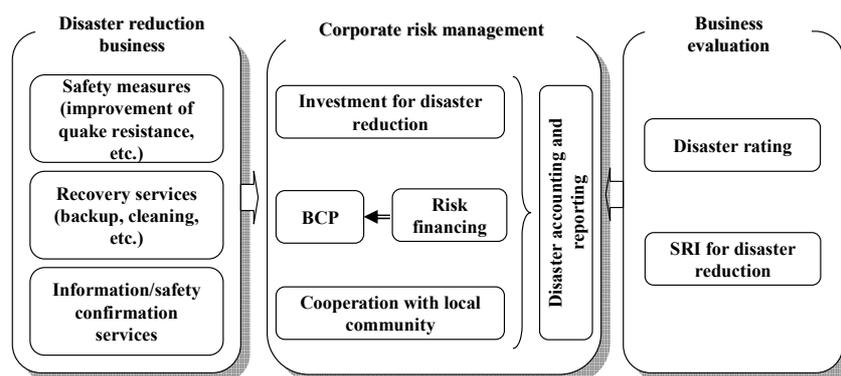
- (i) Prepare a Business Continuity Plan (BCP), i.e. a strategic plan that provides for investment for disaster reduction as part of regular corporate risk management to ensure that companies can return to normal with minimum downtime in case of contingency. This should be followed by risk financing for BCP implementation, enhanced cooperation with the local community, and the disclosure of corporate efforts for disaster reduction through disaster accounting and reporting.
- (ii) Build a mechanism to ensure that companies engaged in proper disaster reduction efforts are properly evaluated (disaster rating, socially responsible investment for disaster reduction).
- (iii) Spread the various products and services developed for disaster reduction through corporate activities.

The following sections examine various ways to improve disaster preparedness by using market forces.



Source: White Paper on Disaster Management.

**Figure 2-2. Trend of National Budget for Disaster Reduction**



Source: DBJ.

**Figure 2-3. Overview of Improving Corporate Disaster Preparedness through Market Forces**

**Table 2-2. List of Disaster Reduction Business**

Type	Major companies	Description
Infrastructure	Wellthy	Diversified water source system
Information services	Vending machine manufacturers and operators Rescuenow.net NTT Communications	Vending machines with electronic bulletin board Transmission of disaster information, safety confirmation system Safety confirmation system using mobile phones
Safety measures	Hoei Koki, Shizuoka Industrial Research Institute of Shizuoka Prefecture	Disaster-sensing bed
Recovery services	Belfor (Germany) HP (U.S.), IBM (U.S.), SunGard (U.S.), HP Japan, IBM Japan	Cleaning for business restoration, etc. Backup, consulting

Sources: Newspaper articles, etc.

### 3. Disaster Reduction Business

#### 3.1 Disaster Reduction Products and Services Created in the Market

Corporations have started to develop a range of products and services associated with disaster reduction (Table 2-2), although this trend has only just begun.

The disaster reduction business mainly includes proactive types of anti-earthquake business such as quakeproof building design and reinforcement works. In recent years, the concept of business continuity management (BCM) – how to ensure the continuation of businesses after a disaster – has gained greater attention, as some companies now require prospective business partners to prepare a BCP before entering into a contract. Consulting firms have therefore

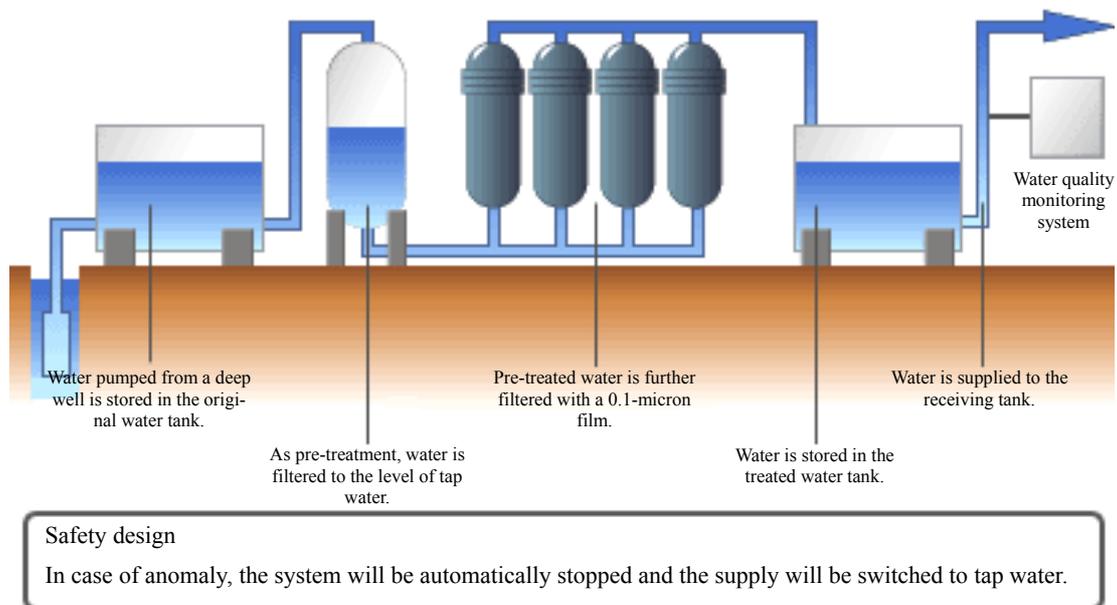
launched support services for BCP preparation.

This section deals with typical types of disaster reduction business excluding general quakeproof products and support for BCP preparation.

#### 3.2 Examples

##### (i) Diversified water source system

Filtered groundwater may be used as tap water during normal times and in case of emergency after a disaster. Groundwater including well water remained unaffected by the Great Hanshin Earthquake and the Niigata-Chuetsu Earthquake, even though the water supply infrastructure was completely devastated. A system of diverse water sources is attracting attention as a quakeproof water infrastructure.



Source: Wellthy website.

Figure 2-4

(ii) Vending machines for disaster reduction

Vending machines with a built-in pager can provide real-time disaster information on an electronic bulletin board. Awareness of potential disasters may also be raised by providing information on disaster prevention during normal times. In case of an emergency or disaster, the machines could even dispense the products for free. They are increasingly being introduced by local governments.



Source: Chiyoda Ward website.

Figure 2-5

(iii) Disaster-sensing Bed

In the Great Hanshin-Awaji Earthquake, 84% of the people killed were either crushed or suffocated by collapsed buildings. Although the fundamental way to reduce earthquake damage is to improve quake resistance, many households cannot afford to do so, but a disaster-sensing bed could provide a breathing space under a collapsed building or fallen furniture.



Source: Shizuoka Prefecture website.

Figure 2-6

(iv) Safety confirmation system

In times of disaster, it becomes difficult to establish phone connections as large numbers of people try to check the safety of their family members, friends, relatives and employees by using fixed or mobile phones, thus overloading the circuits. To avoid this, the NTT Group set up the Emergency Voice Mail Service, available in case of a disaster and on the first day of each month.<sup>6</sup> Other systems include the i-mode Disaster Message Board Service by NTT DoCoMo and the text-mail safety confirmation services provided by NTT Communications and Rescuenow.net, among others. These services transmit text-mail messages to all registered employees, enabling the manager to efficiently check the safety of the employees by counting the number of responses on the system.

(v) Disaster recovery services

Disaster recovery services range from consulting, system backup and the provision of substitute offices to the restoration and cleaning of office equipment damaged by fire or flood. According to IDC, a private market research firm, the backup/restoration service market is worth more than \$3 billion in the U.S., where the awareness of risk management is higher than in Japan due to the existence of major risks including hurricanes and other natural disasters, terrorism, and war.

However, even the best efforts to avoid disaster, such as improving resistance to quakes, fires and flooding, might not be sufficient to prevent damages. In such cases, disaster recovery services would allow businesses to get up and running again quickly and minimize economic losses.

(vi) Refine Construction

The initiative “Refine Construction,” advocated by architect Shigeru Aoki, deserves attention as an innovative experiment at improving quake resistance, by renewing the existing building stock at low cost while improving its quake resistance. At present, almost half of all buildings in Japan were constructed before 1981 and so

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<sup>6</sup> A trial campaign has been held on the first day of each month since September 2004. The trial campaign is also held during National Disaster Prevention Week (30 August-5 September).

probably have only the level of quake resistance that was required under the old standard. The quake resistance of this vast stock, including civil engineering structures such as roads and bridges, needs to be raised. However, it would be impossible to replace them all with new structures at once due to exorbitant costs and adverse environmental impacts. Therefore, the concept of life cycle management, as embodied by “Refine Construction”, should be considered.

(vii) Consideration of a “disaster reduction label”

At a meeting of the Special Board of Inquiry on enhancing disaster management by utilizing the private sector and markets, the Central Disaster Management Council recommended the consideration of a framework for granting a “disaster reduction label” to products and services that serve to prevent disasters.

Just like the eco-label in the field of the environment, this disaster reduction label is designed to raise the awareness of disaster preparedness among consumers by providing them with clear choices for disaster reduction (= safety). It is also hoped that adding the new value of disaster preparedness will help reactivate markets related to disaster reduction, and eventually lower the costs of goods and services for disaster prevention, which in turn will promote the diffusion of such goods and services.

## 4. New Types of Risk Financing

### 4.1 Outline of Financial Schemes

(i) Contingent debt facility (CDF)

The substantial compensation payouts made following successive disasters in the 1990s caused some insurance and reinsurance companies to go bankrupt, thus raising premium rates. New methods of disaster risk management have thus been considered, including the securitization of disaster insurance, which allows diversification of disaster risk beyond the reinsurance market and into the far larger financial markets. The hedging of insurance risks in the financial market involves “risk financing” techniques. Backed by the development of financial engineering and improved techniques for evaluating natural disasters and other risks, the use of risk financing is expected to spread in the years ahead.

A disaster will not only cause direct financial losses in the form of declining asset values, business interruption or cash crises, but also have indirect effects including damaging financial conditions through the decline in share prices and ratings. Such financial risks require a proper mix of techniques including earthquake insurance, funds on hand (cash and deposits) and risk finance.

An earthquake in Tokai or directly under the Tokyo metropolitan area would cause very serious damage, making insurers reluctant to enter the corporate earthquake market in the two regions. Moreover, an earthquake policy only covers property losses such as the collapse of buildings and not the cash crisis that will be triggered by reduced sales due to shutdowns. In order to address this situation, a contingent debt facility (CDF) typically undertakes to provide a loan that will cover part of the essential funds required for recovering from a major earthquake. Earthquake risk is quantified in determining the applicable interest rate, and the loan thus provided may be used as relief funds following an earthquake. This type of risk financing would also demonstrate to stakeholders that the company is prepared for major disasters including earthquakes.

The Development Bank of Japan, in cooperation with the Shizuoka Bank and Mitsui Sumitomo Insurance as loan arrangers, has ex-

tended a CDF-syndicated loan to Tomoegawa Paper (Mizuho Securities as advisor) (Figure 2-7)<sup>7</sup> It is expected that more companies will follow suit and consider integrating the CDF into their business continuity planning to supplement earthquake insurance.

#### (ii) CAT bond

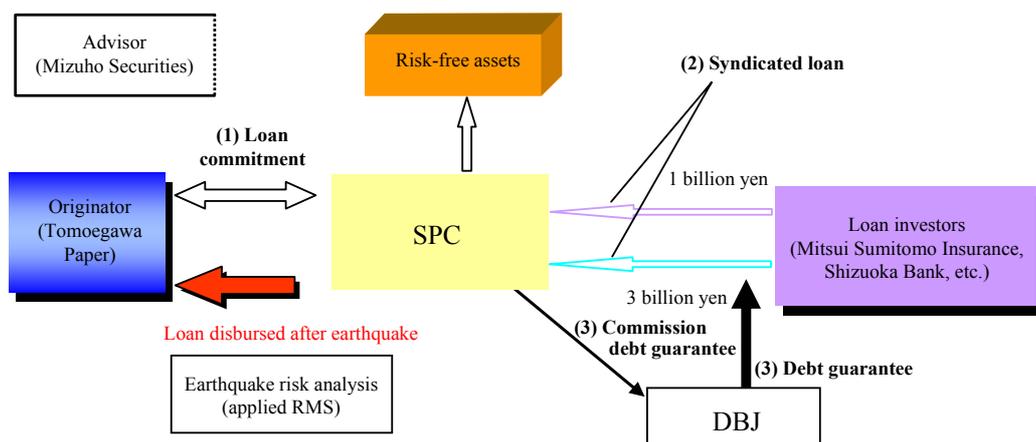
A CAT bond is designed to transfer catastrophe risk (risk of major disasters including earthquake and flood) to investors through securitization.

Money invested in an issued bond is reinvested safely in a trust account (usually opened in a tax haven). In case of an earthquake whose scale exceeds a predetermined level, the investor loses the right to redemption and the money will be paid directly to the issuer. Payments to the investor in exchange for the risk of expropriation represent the insurance premiums for the issuer.

When no earthquake insurance is available, CAT bonds offer another means of risk financing, as they can collect funds immediately through the vast bond market.

Japanese issuers of CAT bonds include Oriental Land and the mutual aid union of Japan Agricultural Cooperatives (Zenkyoren).

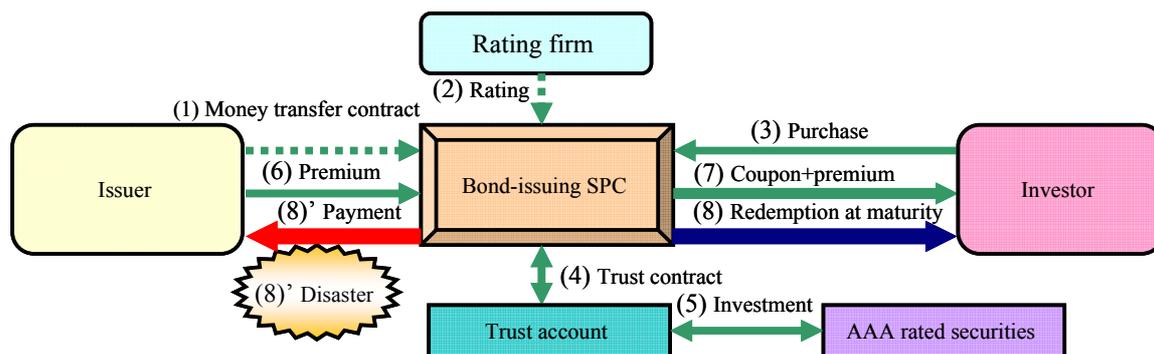
The characteristics of earthquake insurance, CAT bond and contingent risk facility are summarized in Table 2-3.



Source: DBJ website.

Figure 2-7. CDF Scheme

<sup>7</sup> [http://www.dbj.go.jp/japanese/release/re12004/1108\\_pfi.html](http://www.dbj.go.jp/japanese/release/re12004/1108_pfi.html)



Source: DBJ.

Figure 2-8. CAT Bond Scheme

Table 2-3. Comparison of Risk Finance Techniques

	Earthquake insurance	CAT bond	Contingent risk facility
Period	Short term (1-2 years)	Possibly long term (about 10 years)	Possibly long term
Cost	Premium revised annually	Cost defined as premium	Interest rate determined by earthquake preparedness
Payment availability	World reinsurance market: ¥10 trillion	World bond market: ¥3,000 trillion Risk-free as secured funds	High
Immediate payment	Subject to assessment procedures	Immediate payment under trigger conditions	Immediate payment under trigger conditions
Problems	Limit in underwriting capacity	Precision of disaster model. Basis risk	Precision of disaster model Basis risk
Others		Zenkyoren: ¥55 billion Oriental Land: ¥20 billion	Oriental Land: ¥10 billion Tomoegawa Paper: ¥4 billion

Sources: Newspaper articles.

(iii) SRI fund for disaster reduction (OMY Fund)

OMY refers to the 111 ha area around Tokyo Station comprising Otemachi, Marunouchi and Yurakucho districts. The OMY area is one of the largest business districts in Japan, with 4,100 companies employing 240,000 workers and representing 20% of GDP. Any disaster in this area would cause extensive disruption, due to not only direct damages but also business shutdowns.

The OMY Fund, which is still at the planning stage, is an SRI fund for disaster reduction designed to improve the disaster preparedness and business continuity in the whole area by investing in companies that have developed good disaster reduction capacities through self-help and mutual aid efforts. Expectations are high for the creation of the Fund as socially responsible investment (SRI) progresses, led by the

“eco-funds” that invest in companies actively involved in environmental conservation.<sup>8</sup>

#### 4.2 Assessment of Earthquake Risk in Real Estate Securitization

Real estate securitization means to invite investors who will be given the right to receive the value of the property itself as well as the rent. With the launch of J-REIT in 2001, the market has been expanding as companies seek to move corporate assets off the balance sheet in view of the introduction of depletion accounting in 2005. Real estate securitization has also been used as a financing technique by companies that experience difficulty in issuing bonds or obtaining bank loans due to their poor financial standing.

In securitizing real estate, the property has

<sup>8</sup> See Chapter IV for details.

to be evaluated properly from a holistic viewpoint, taking into account applicable laws and regulations, the trend of the real estate market, environmental aspects including soil pollution, earthquake resistance and topography (due diligence). The result of due diligence is then presented to rating firms and potential investors for consideration.<sup>9</sup> Thus, disaster prevention measures including quake resistance improvement will raise the value of property through the due diligence process.

**5. CSR and Disaster Reduction**

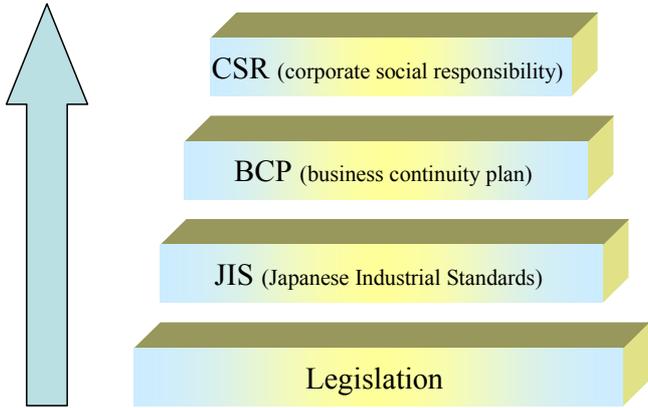
The issue of corporate social responsibility (CSR) has been much discussed in recent years. With the emergence of various stakeholders in the changing social environment, businesses are realizing that they must broaden their focus from the pursuit of profits to environmental and social concerns if they are to avoid damage to their credibility, brand image or even corporate value.

CSR is designed to strike a proper balance between economic, environmental and social considerations. As global warming has come to the fore, more companies have become involved in environmental initiatives in recent years, developing environmentally sound businesses and products (services) in many cases. But what are the social aspects? In fact, social responsibility

covers multiple aspects including corporate ethics, compliance, support for civil society and *mecenat* (support for art activities). Although Japanese companies have long been involved in such initiatives, the recent spate of corporate scandals has led stakeholders including consumers and shareholders to express their concerns about corporate ethics and compliance.

For instance, assessments of earthquake resistance should be made and appropriate measures for compliance should be taken, even though the Law on the Promotion of Quakeproof Repairs does not have any enforcement clause. Any casualties in a building that does not comply with the law may trigger lawsuits. In one case, repair and rehabilitation works as well as tenant movements suddenly stepped up after the district was designated as a potential disaster area. These examples demonstrate that businesses are required to take measures that go beyond mere compliance.

Future CSR will be required to reconcile the pursuit of profits with environmental and social considerations for the attainment of a sustainable society. With regard to disaster reduction, CSR will have to consider the security of the local community, local economy, employment and impact on the stable supply of goods and services, as well as protecting the company’s own assets against any disaster (Figure 2-9).



Source: DBJ.

**Figure 2-9. Overview of Corporate Efforts for Disaster Reduction**

<sup>9</sup> Reportedly, any probable maximum loss (PML) of over 20% will affect the rating in securitization.

## 6. Cooperation with Communities in Case of Disaster

### 6.1 Cooperation with Local Governments

Local governments have the most important role to play as providers of “public assistance” in a time of disaster. As proven by major disasters in the past including the Great Hanshin-Awaji Earthquake and the Niigata-Chuetsu Earthquake, however, the scope of public assistance becomes limited in larger disasters.

Citizens and businesses have huge potential for providing mutual aid by ensuring their own security and confirming the safety of family members and employees themselves. As highly organized groups, companies could make an even greater contribution than the public assistance provided by local governments, if they could provide their skills and facilities for mu-

tual-aid purposes.

To achieve this, businesses should build a network with the local community and government during normal times to improve the disaster preparedness of the whole area. The following are some examples of cooperation between local governments and businesses.

(i) Agreements on the supply of daily commodities and fuel

Agreements with convenience stores, supermarkets and gas stations to supply sufficient food, daily commodities and fuel in case of a major disaster.

(ii) Agreements on the restoration of transport infrastructure

Agreements with the construction and civil engineering industries to provide support when

**Table 2-4. Major Agreements between Local Governments and Businesses**

Objective	Local authorities	Business entities
Supply of daily commodities	Tokushima Prefecture Shiga Prefecture Fujinomiya City, Shizuoka Prefecture Kobe City and other 19 cities and 7 towns Atsugi City, Kanagawa Prefecture Wakayama Prefecture	Tokushima Sogo, Lawson, Sunkus and Associates, etc. Family Mart Asahi Soft Drinks Coop Kobe Sapporo Beer and Beverage, JA Ehime Seven Eleven Japan
Fuel supply	Tokushima Prefecture	Tokushima Petroleum Dealers Association
Restoration of transport infrastructure (rubble removal, etc.)	Nerima Ward Wakayama Prefecture Saitama Prefecture Shizuoka Prefecture, Shizuoka Prefectural Police	Nerima Constructors Association, Tokyo Automobile Service Promotion Association – Nerima Branch Wakayama Constructors Association Saitama Japan Industrial Waste Association Shizuoka Towing Service Association, Shizuoka Towing Service Cooperative
Provision of evacuation sites and accommodation of stranded people	Saitama Prefecture Nagoya City Tokyo Metropolis Shinjuku Ward Chiyoda Ward Chiba Prefecture	Saitama Petroleum Dealers Cooperative, Urawa Tobu Hotel and other 4 sites Noritake Tokyo Petroleum Dealers Association Waseda Univ., Gakushuin Univ., etc. Meiji Univ. Chiba Petroleum Dealers Association
Transport routes	Wakayama Prefecture Shizuoka Prefecture Shizuoka Prefecture Tokushima Prefecture	Nankai Ferry Japan Highway Public Corporation All shipping companies operating in the prefecture. Tokushima Trucking Association
Loans for living expenses	Shizuoka Prefecture	Shizuoka Bank, Shimizu Bank, Suruga Bank
Disaster information	Koto Ward	Tokyo Bay Network, Rainbowtown FM Broadcasting

Sources: Newspaper articles.

roads become impassable due to cave-ins or obstacles.

(iii) Agreements on evacuation sites and the accommodation of stranded people

Agreements with hotels and other private companies and universities to open up their facilities as temporary shelters in a time of disaster. Agreements are also concluded with gas stations for accommodating stranded people.

(iv) Agreements on transport routes

Agreements are concluded with shipping companies to transport daily commodities and relief workers to isolated areas where access by road or railway has been cut off.

(v) Agreements on loans to cover living expenses

Prior agreements to enable disaster victims to obtain loans for living expenses without delay even in the chaos following a disaster.

(vi) Agreements on disaster information

Agreements with TV and radio stations to give priority to disaster information over normal programming.

## 6.2 Community Disaster Reduction through Cooperation among Businesses

In addition to cooperation between local governments and businesses, the resilience of communities needs to be built through cooperation among businesses. There are many cases of business cooperation in Japan to improve the disaster preparedness of communities, as shown by the examples below.

(i) Liaison Group to Prepare for Major Disasters (Fuji, Shizuoka Prefecture)

The City of Fuji has a large concentration of paper and chemical-related plants, and so local residents and governments requested businesses to take measures to minimize secondary disasters such as plant explosions and fires following a Tokai earthquake, as well as primary damages.<sup>10</sup>

<sup>10</sup> According to the Third Assessment of Earthquake Damages conducted by the Shizuoka prefectural government, a seismic intensity of lower 6 or over on the Japanese scale will be registered in Fuji in case of a Tokai earthquake,

However, individual companies did not know where to start, and many did not even have an officer in charge of disaster reduction. The Fuji Chamber of Commerce and Industry therefore created in April 2004 a Liaison Group to Prepare for Major Disasters. This organization includes some 30 companies that volunteered to join the Group, as well as local authorities including the Shizuoka prefectural government and the Fuji municipal government.

The aim of the Group is to raise awareness, build expertise and consider concrete measures to be incorporated in a manual through exchange and sharing of issues and information among responsible corporate officers, thereby improving the disaster preparedness of the community as a whole. The Group provides the participating companies with an opportunity to share disaster prevention measures, information on disaster risk management and relevant skills. The prefectural and municipal governments and the Chamber of Commerce and Industry also expect the Group to play a key role in sustaining the local industry, as well as in providing security to the whole community, as it is clear that an earthquake would have a huge impact on the local economy and employment if the community was not prepared.

(ii) OMY Neighborhood Association for Disaster Reduction (Chiyoda Ward, Tokyo)

As mentioned earlier, the OMY area – Otemachi, Marunouchi, and Yurakucho – is the heart of the Japanese economy, accounting for some 20% of GDP.

The Tokyo metropolitan government estimates that a strong earthquake directly under the metropolitan area, which is considered to have a 70% probability of occurring within the next 30 years, will leave some 600,000 people stranded in Chiyoda Ward alone. Along with preparing the area for disaster, how to accommodate those stranded people is a major issue to be solved.

This issue is being addressed by the Association for the Accommodation of Stranded People in Tokyo and Yurakucho Station Area (“Neighborhood Association for Disaster Reduction”) – a group of some 60 companies operating in the OMY area led by Mitsubishi Estate, the

resulting in the collapse of 6,745 buildings.

largest landowner in the district.

A comprehensive emergency drill was co-organized in January 2005 by the Neighborhood Association and Chiyoda Ward to ensure the safe and early return home of stranded people when a strong earthquake directly hits the area. Training activities included escape guidance, safe return home and cargo shipment by the Self Defense Force.

### III Corporate Risk Management and Business Continuity Plan (BCP)

#### 1. Developments in Corporate Risk Management

##### 1.1. Developments in Japan

Following the Great Hanshin-Awaji Earthquake and subsequent incidents, accidents and scandals, the Guidelines for development and implementation of risk management systems was published as a Japanese Industrial Standard in March 2003. The Guidelines describe typical techniques to support risk and crisis management by companies and local governments. They define risk management as a framework of corporate management comprising the involvement of management, the establishment of routine measures and the development of human resources, and suggests that resilience be continually strengthened by repeatedly applying the PDCA (plan-do-check-action) process to risk management. Although the Guidelines define a managerial framework as in the case of ISO14000 (environmental management system) and ISO9000 (quality management system), they do not offer a certification system but rely on voluntary efforts by corporations. The Guidelines comprise the following seven principles: (i) risk management policy, (ii) risk management planning, (iii) implementation of risk management, (iv) assessment of the performance and effectiveness of risk management systems, (v) correction and improvement of risk management systems, (vi) review by the CEO and (vii) system and mechanism for maintaining the risk management system. Continued improvement is possible by starting with the development of an organism or mechanism (Principle vii) and then repeating Principles i through vi within its framework.<sup>11</sup> The Guidelines cover all entities including businesses and local governments.

Elsewhere, the METI Study Group on Risk Management and Internal Control issued in July 2003 the “Guideline for Internal Control That Functions Together with Risk Management.”

<sup>11</sup> “New Corporate Management and Risk Management: Guidelines for Building a JIS Risk Management System JISQ2001,” Tokyo Marine Risk Consulting.

The Guideline defines risk management as “a series of company activities that appropriately manage various internal and external risks associated with its business, in the course of corporate management, to maintain and augment its value” and internal control as “a system or a process established and operated in a company to carry out its business properly and efficiently.” It also stresses the need to integrate internal control and risk management by stating that these two concepts, which have grown out of different backgrounds, share broadly the same objectives from the standpoint of preserving and enhancing enterprise value by responding to a variety of risks surrounding companies.<sup>12</sup>

##### 1.2. Developments in the U.K.

In 1994, the U.K. Business Continuity Institute (BCI) was established to draw up guidelines on business continuity management (BCM) and train BCM experts. The BCI is a membership organization with 1,650 members in 45 countries worldwide, including Asian economies such as Hong Kong, Singapore, Thailand and Japan as well as those in Europe and North America.

The “Guide to Business Continuity Management” prepared by the BCI in 2002 assumes that BCM will be effectively implemented through a cyclical process comprising the following five stages: (i) understanding one’s business, (ii) building BCM strategies, (iii) developing and implementing a BCP, (iv) establishing the BCM culture and (v) implementing and updating the BCM. Published as PAS (Publicly Available Specification) 56 of the British Standards Institute (BSI), the Guide is the first to present a comprehensive idea of BCM, for which no unified concept or concrete techniques had existed.

Currently, there is a trend toward global standardization of risk management. As the BCI has moved closest to standardization, it encourages the International Organization for Standardization (ISO) to follow suit. With similar encouragement by the U.S., the ISO is now moving toward drawing up guidelines.<sup>13</sup> Discus-

<sup>12</sup> White Paper on International Economy and Trade 2004.

<sup>13</sup> The matter is currently being considered by the High-level Advisory Group on Security established under the Technical Management Board (TMB).

sion on standardization needs to consider cultural differences among nations. As far as risk management is concerned, Japan should make its position clear on earthquakes and other disasters that have a major impact on its territory and people, while introducing foreign techniques as deemed appropriate.

In Japan, the BCI Japan Alliance was established in December 2003, following the certification of InterRisk Research Institute as BCI's Japanese branch. The Alliance has been involved in awareness-raising activities, providing BCM information to businesses, government ministries and agencies and universities.

In September 1999, the Institute of Chartered Accountants in England and Wales (ICAEW) published the Turnbull Guidance,<sup>14</sup> which calls for the integration of risk management and internal control. The London Stock Exchange requires listed companies to comply with the Turnbull Guidance for business years ending 23 December 1999 or later, thus virtually requiring corporations to take measures for risk management.

### 1.3. Developments in the U.S.

Activities to promote risk management, although less comprehensive, have also been taken in the U.S., mainly by the BCI, DRII<sup>15</sup> and the FEMA (Federal Emergency Management Agency)<sup>16</sup>. Following a series of corporate scandals, five major accounting associations also launched an initiative to consider internal control matters in June 1985 by establishing a Committee of Sponsoring Organization of the Treadway Commission (COSO). In its report published in October 1987, the National Commission on Fraudulent Financial Reporting stated, "top management first must establish the proper environment, one in which fraudulent financial reporting is less likely to occur and, if it does occur, is more

likely to be detected." In line with this report, the COSO published the Internal Control—Integrated Framework (COSO report) in 1992. The idea of the COSO report, referred to in the BIS Guideline as well as in the U.S. and Japanese auditing standards, has now become the *de facto* global standard on internal control. Furthermore, the COSO Enterprise Risk Management Framework, prepared in 2003, seeks to integrate risk management with internal control.

Moreover, it is now a statutory obligation under the Sarbanes-Oxley Act of 2002, in order to restore the reliability of financial reporting in response to a series of financial scandals, for company management to attach certification on the effectiveness of disclosure controls and procedures, and to assert internal control over financial reporting with an attestation by an independent auditor when filing registration documents with the SEC.<sup>17</sup>

## 2. Outline of Business Continuity Plan (BCP)

### 2.1. What is BCP?

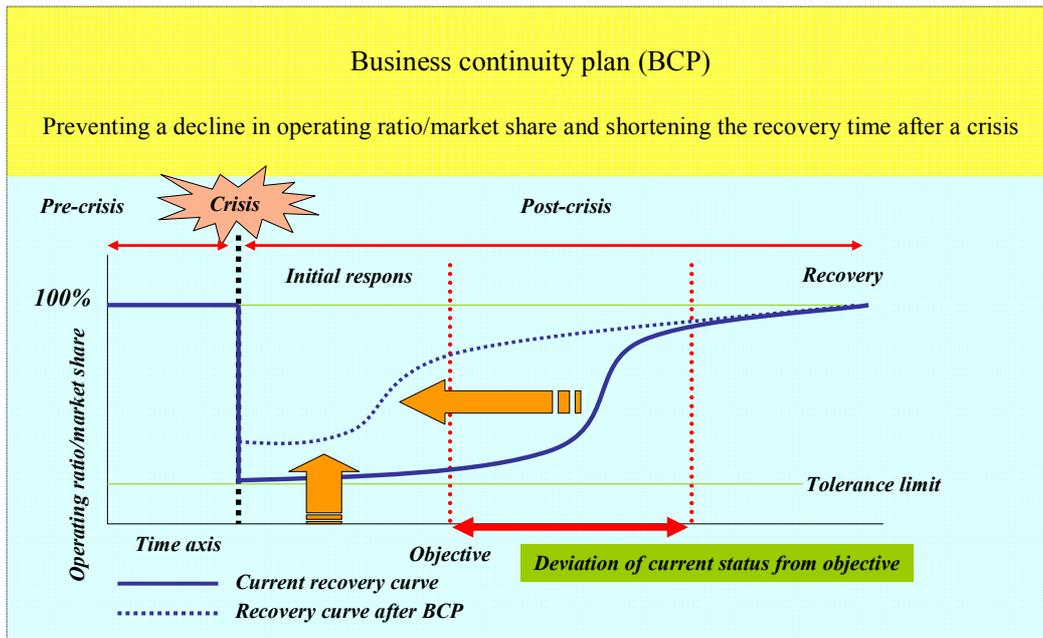
A business continuity plan (BCP) is a management strategy to resume critical operations in the shortest possible time following any business interruption due to contingency and thus prevent the subsequent loss of customers, decline in market share and deterioration in corporate reputation by taking necessary measures to prepare for emergency situations such as the development of a chain of command, backup system, the training of substitute personnel, arrangements for immediate safety confirmation and the preparation of manuals. Therefore, BCP is at the core of corporate risk management. Making proactive plans for providing priority products and services in an emergency would raise the confidence of customers and ultimately improve the company's value.

<sup>14</sup> The Turnbull Guidance, issued by the ICAEW in September 1999, aims at promoting the introduction of risk management and internal control systems by companies (InterRisk Research Institute "Disclosure of Risk Management Information in U.K. Companies: Outline of Turnbull Guidance," *Corporate Risk Information*, Vol. 9).

<sup>15</sup> Established in 1988, DRII (Disaster Recovery Institute International) operates a certification system for business continuity managers.

<sup>16</sup> See Chapter IV, Section 1, 1.2 (i).

<sup>17</sup> "Internal Control in the New Era of Risks," Study Group on Risk Management and Internal Control, June 2003.



**Figure 3-1. Outline of BCP**

A BCP is typically managed and improved through the following management cycle.

Setting objective	Risk assessment	Business impact analysis	Preparing BCP
Monitoring	Process improvement	Modifying objective	

The following matters need to be considered in risk assessment.

### Risk Assessment – Case of an Earthquake

<p>Measures to prevent casualties</p> <ul style="list-style-type: none"> <li>* Can casualties be avoided?</li> </ul> <p>Physical loss</p> <ul style="list-style-type: none"> <li>* Physical loss, including buildings and machinery inside buildings, may be estimated on the basis of assumed scale of the earthquake, the extent of quake resistance and the current status of securely fixing machinery.</li> </ul> <p>Impact on business</p> <ul style="list-style-type: none"> <li>* Operating loss = shutdown period (days)/365 × operating profits</li> <li>* Shutdown period is to be estimated in light of the company's operational flows.</li> <li>* Total loss may be estimated by specifying the flow of each process in the company.</li> <li>* Risk associated with operational procedures for recovery</li> <li>* Impact on finance</li> </ul> <p>Decline in brand value</p> <ul style="list-style-type: none"> <li>* Secondary damage including complaints</li> <li>* Harmful rumors</li> </ul>
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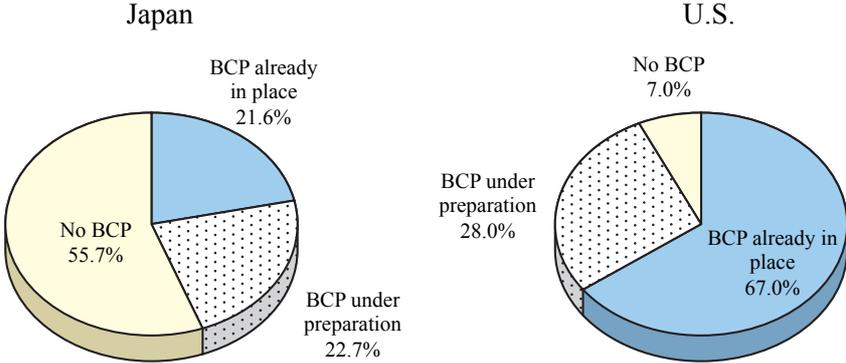
BCPs range from formal plans prepared as requested by foreign companies and rudimentary ones that are no more than the revised versions of traditional disaster prevention or crisis management manuals, to full-fledged plans incorporating a management cycle that enable responses to expected scenarios as well as field elements including the flow of internal control. BCPs are different from traditional disaster prevention plans and crisis management manuals in that

they are linked with corporate management through the definition of priorities in emergency situations. Nonetheless, some companies have prepared a disaster prevention plan that is closer to a BCP, incorporating a process leading to reconstruction or recovery. However, BCP refers to a plan that addresses not only earthquake risk but also various other risks such as terrorism and SARS. Very few Japanese companies appear to have developed a BCP in this sense.

Business continuity and recovery planning at financial institutions

- **Scenario analysis**  
Although many financial institutions have undertaken scenario specification and impact assessment for each scenario, few have conducted an assessment on the probability of each scenario.
- **Distance between main center and backup center**  
20-50 km in most cases. Many financial institutions ensure a distance of over 200 km for deposit and foreign exchange systems.
- **Switchover time**  
In most cases, one to four hours are required to complete the switchover to the backup center or backup office. For deposit and foreign exchange systems, the switchover may take more than 24 hours in many cases.
- **Training**  
As emergency drills, many companies have introduced training on the setup and operation of system backup equipment and data input and output. However, few companies involve domestic office staff or external partners in such training.
- **Outsourcing**  
43 of the 68 companies covered by the survey (63%) responded that they would use outsourcing in case of damage to their computing centers. 36 companies (53%) would do so in case of damage to business offices.

Source: Bank of Japan, "Questionnaire Survey on Business Continuity and Recovery Planning in Emergency Situations."



Note: The total of percentages for the U.S. exceeds 100% in the original data.  
Source: KPMG Business Assurance, "Business Continuity Management (BCM) Survey Report 2004."

Figure 3-2. Business Continuity Planning in Japan and U.S.

## 2.2. BCP-related Developments in Japan and Abroad

It was the 9/11 terrorist attacks in the U.S. that focused attention on BCP for the first time. Merrill Lynch and other companies located near the World Trade Center were able to minimize interruption of business by using backup offices secured under their BCPs. Elsewhere, the Basel Committee on Banking Supervision placed renewed emphasis on the need for BCPs in “Sound Practices for the Management and Supervision of Operational Risk” published in July 2002. Those developments apparently have encouraged the development of BCPs by companies.

In Japan, the Bank of Japan published in March 2002 “Business Continuity Planning on the Assumption of Damage to Financial Institution Headquarters.” This was followed by a questionnaire survey on the current status of business continuity and recovery planning, the results of which were made public in June 2003. The results indicated that more than half of financial institutions have introduced some kind of contingency planning, but that there are considerable differences among those institutions regarding the distance between the main center and the backup center and the time required for switchover.

Elsewhere, the aforementioned Working Group on Businesses and Disaster Reduction stated in “Businesses and Disaster Reduction: Future Challenges and Directions” published in April 2003 that conditions needed to be improved to promote business continuity planning as part of corporate risk management. The Ministry of Economy, Trade and Industry (METI) has also proposed the preparation of BCP guidelines in its Research Group on Corporate Information Security Governance.

There has been little analysis of the linkage between business continuity and corporate rating. As the importance of business continuity increases in corporate management, however, it is likely that business continuity will also influence corporate ratings.<sup>18</sup>

A 2004 survey conducted by KPMG Business Assurance (Figure 3-2) indicates that 67%

<sup>18</sup> “Business Continuity: Corporate Crisis Management from the Viewpoint of Rating Agencies,” *Exchange Square*, October 2003.

of U.S. companies have prepared a BCP, a share that rises to 95% if those companies currently preparing a BCP are included. In contrast, only 21.6% of Japanese companies responded that they had prepared a BCP. Even if the companies preparing a BCP are included, this share remains at 44.3%. Thus, there is a wide discrepancy between Japanese and U.S. companies regarding business continuity planning. Japanese companies need much greater awareness if they are to universally adopt a BCP.

## 2.3. Background for Business Continuity Planning

### (i) Requirements from abroad

Since 9/11, business continuity planning has made substantial headway in Europe and North America, with many companies requiring their supply chains to introduce BCPs. Japanese companies are also required by overseas business partners to prepare a BCP, particularly in export-oriented industries such as automobiles and electric machinery.

### (ii) Awareness of operating loss

The loss of commercial and industrial stocks caused by the Great Hanshin-Awaji Earthquake amounted to ¥2.54 trillion, an amount that was surpassed by the operating loss of ¥2.6 trillion in terms of reduced production, difficulty in procuring raw materials and lost opportunities resulting from the disruption of logistics (Table 3-1). Much of the loss might have been prevented if businesses had prepared a BCP. After this bitter experience, companies have come to recognize that business continuity is of paramount importance in terms of maintaining and improving corporate value.

**Table 3-1. Losses from Great Hanshin-Awaji Earthquake**

Stock losses	
Buildings	¥1,420 billion
Plant & equipment	¥560 billion
Raw materials & products	¥560 billion
Total	¥2,540 billion
Flow losses	
Commercial	¥1,660 billion
Commercial/industrial	¥940 billion
Total	¥2,600 billion

Source: Nihon Keizai Shimbun, 28 June 1995.

The recent Niigata-Chuetsu Earthquake inflicted severe damage on auto and electric machinery parts manufacturers. Companies which use an efficient production system to minimize stock, including the just-in-time method, are likely to experience a shutdown if supplies from parts manufacturers are cut off. Indeed, Nihon Seiki, the top manufacturer of motorcycle instruments, stopped supplying products as its plant suffered damage from the earthquake, thus affecting the production of motorcycle manufacturers such as Yamaha Motor and Kawasaki Heavy Industries. Niigata Sanyo Electronics, a subsidiary of Sanyo Electric and major supplier of semiconductors for audio-visual applications, suffered a huge

estimated loss of ¥37 billion due to the shutdown, in addition to direct losses of ¥18.4 billion, an inventory loss of ¥4.6 billion and a recovery cost of ¥27 billion.<sup>19</sup>

(iii) Viewpoint of corporate social responsibility (CSR)

It is crucial to consider what measures should be taken to satisfy stakeholders when facing risks. So far, companies have focused on how to protect their own managerial resources in crisis situations. From now on, companies that incorporate stakeholder considerations in their BCP will receive higher evaluation from the viewpoint of CSR.

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<sup>19</sup> Nihon Keizai Shimbun, 22 December.

## IV Issues and Outlook of Corporate Value Improvement through Disaster Management

### 1. Approach to Corporate Efforts for Disaster Reduction

This section outlines techniques for evaluating corporate efforts for disaster reduction. In addition to these techniques, the Cabinet office has announced that it will develop a separate indicator of corporate disaster preparedness.

#### 1.1. Evaluation Technique Addressing Risks as a Whole

##### **Crisis Management Regime Diagnosis System of Tokio Marine & Nichido Risk Consulting**

The system diagnoses corporate crisis management regimes by quantifying the answers given to a series of questions related to the following nine subjects: top management; organization (e.g. group in charge of crisis management); crisis management process (risk analysis/evaluation, measures against risks, preparation of a crisis management program); the implementation, evaluation and correction of a crisis management program; the development of organizational capacity/human resources; information processing in crisis situations; management records (crisis management documents, activity records); emergency regime and planning (response, public information, media relations); and recovery planning (plan for returning to normal operation).

#### 1.2. Indicators Emphasizing Earthquake Factors

##### (i) FEMA (Federal Emergency Management Agency) indicator

The FEMA was established in 1979 by integrating the emergency management functions that had previously been dispersed among multiple departments and agencies. The Agency deals with a wide range of risks from natural disasters to armed conflicts. As regards earthquakes, four guidelines have been presented for businesses, counties, cities and metropolitan areas, respectively. The FEMA indicator typically identifies the responsibility of each sector, providing a basis for many evaluation techniques for disaster

management in Japan.

#### **Outline of integrated earthquake preparedness guideline for businesses**

##### Part 1 User guide

- A. Introduction
- B. Cooperation with local governments in planning
- C. Essential elements of corporate earthquake planning
- D. Objectives
- E. Premises for planning
- F. Planning procedure

##### Part 2 Planning guide

- A. Planning components
- B. Burden sharing
- C. Emergency response
- D. Business recovery
- E. Earthquake preparedness

##### Part 3 References

*Sources:* Sumitomo Marine Risk Research Institute, *Federal Emergency Management Agency*, Japanese Standard Association, 1995; Research Report for the Improvement of Corporate Disaster Preparedness in the Gakunan Area.

##### (ii) BAREPP (Bay Area Earthquake Preparedness Project) corporate disaster preparedness checklist

The checklist is composed as follows.

- 1) Disaster prevention and mitigation  
Buildings, indoor contents, education and awareness-raising, business continuity, data management/backup, management of hazardous materials, quake-resistant computer equipment.
- 2) Occurrence of an earthquake  
Damage inspection, liaison with administrative organizations, backup power, evacuation, risk assessment of damaged buildings, emergency relief, housing/food/medical care in emergency situations, public information.
- 3) Rapid restoration  
Inspection of damage to facilities, preparation for rubble disposal, recovery of facilities, preparation for emergency measures including the construction of shelters, ensuring the supply of necessary goods and materials, arrangements with the mass media (public in-

formation), planning for restoring functions, coordination with the local community, planning for loans and investment, cooperation with banks where accounts are held, liaison with local authorities.

Specific questions include:

- 1) Disaster prevention and mitigation
  - Have you identified the construction method, risks and vulnerable spots of the buildings that constitute your workplace?
- 2) Occurrence of an earthquake
  - Have you made plans for preliminary estimation of damages and identification of dangerous situations?
- 3) Rapid restoration
  - Have you made plans to conduct a comprehensive investigation of the damage to facilities to determine whether the operation should be relocated temporarily or continued at the same site?

*Sources:* Morio Ino, "Earthquake Preparedness of U.S. Companies," *Earthquake Journal* No. 13, Association for the Development of Earthquake Prediction, 1994; Research Report for the Improvement of Corporate Disaster Preparedness in the Gakunan Area.

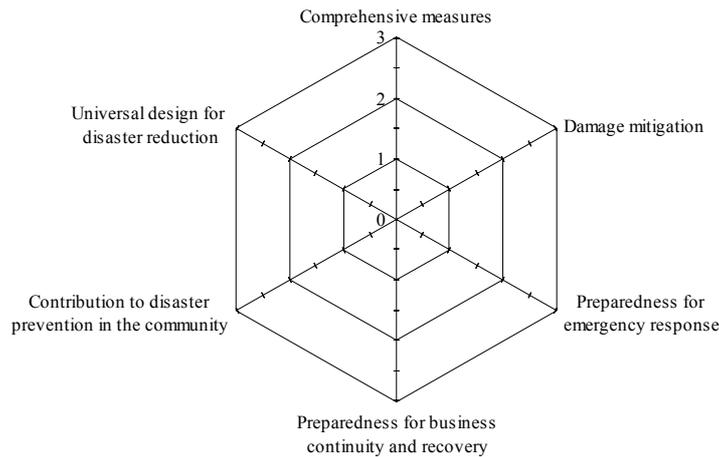
(iii) Research Report and Check Sheet for the Improvement of Corporate Disaster Preparedness in the Gakunan Area

Fuji Tokoha University, Fuji Prefectural Administration Center, the City of Fuji, the City of

Fujinomiya, the Town of Shibakawa, and related chambers and associations of commerce and industry, all located in the potential disaster area of a Tokai Earthquake, worked together to establish the Study Group for the Improvement of Corporate Disaster Preparedness in the Gakunan Area, in order to promote preparedness for the Tokai and other earthquakes. Based on the results of a questionnaire survey by the Study Group, a Check Sheet for the Improvement of Corporate Disaster Preparedness against a Tokai Earthquake was developed for use by business establishments including SMEs, to enable them to check their own disaster preparedness. Two sets of check sheet have been prepared, one for comprehensive measures and another for individual measures. The check sheet for individual measures comprises the sections dealing with damage mitigation, preparedness for emergency response, preparedness for business continuity and recovery, contribution to disaster prevention in the community and universal design for disaster reduction. Each section consists of several items, to be evaluated on a scale of 0 to 3. The average score is calculated for each section to draw a balance chart, which is used to identify the level of achievement. Progress may be monitored by periodic evaluation.

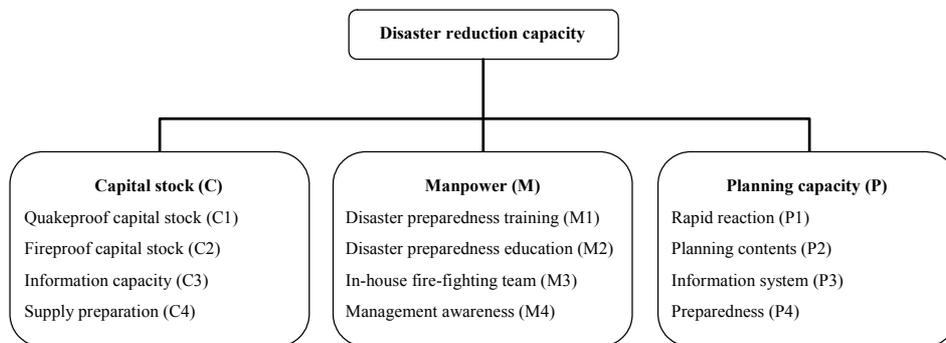
**Table 4-1. Check Sheet for Improvement of Corporate Disaster Preparedness against a Tokai Earthquake**

Section	Comprehensive measures	Individual measures					Aggregate total
		II-1			II-2	II-3	
		ii-1	ii-2	ii-3			
		Damage mitigation	Preparedness for emergency response	Preparedness for business continuity and recovery	Contribution to disaster prevention in the community	Universal design for disaster reduction	
Score (A)							
No. of items (B)	16	7	8	6	5	5	47
Upper line: manufacturing	16	5	11	6	5	6	49
Lower line: commerce							
Average (C) = A/B	•	•	•	•	•	•	



Source: Study Group on the Improvement of Corporate Disaster Preparedness in the Gakunan Area, “Disaster Preparedness of Your Company.”

**Figure 4-1. Balance Chart for Disaster Resilience Improvement**



Source: Prevention Times, No. 219, 2004.

**Figure 4-2. Composition of Disaster Reduction Capacity Measures in CMP Method**

(iv) CMP method<sup>20</sup>

This method, proposed by Professor Hideki Kaji of Keio University and Takayuki Yamamoto of Koito Manufacturing, evaluates corporate disaster preparedness in terms of capital stock, manpower and planning capacity based on the data obtained from a survey covering 110 companies operating in Fujisawa, Kanagawa Prefecture (Figure 4-2).

The CMP method calculates four indicators for capital stock (quakeproof capital stock, fireproof capital stock, information capacity, supply preparation), four indicators for manpower (dis-

aster preparedness training, disaster preparedness education, in-house fire-fighting team, management awareness) and four indicators for planning capacity (rapid reaction, planning contents, information system, preparedness). Building on lessons learned from the Great Hanshin-Awaji Earthquake, the method not only considers the existence of corporate disaster reduction plans, but also evaluates the contents of such plans. In addition, it takes into account the adequacy of communication systems involving external entities including business partners. The method also calculates the weight of each indicator through principal component analysis to produce three composite indicators: overall disaster preparedness, structural

<sup>20</sup> CMP stands for capital stock, manpower and planning capacity.

**Table 4-2. Number of Questions and Weight for Each Indicator**

Basic nine categories	Prefectures		Wards and cities	
	No. of questions	Weight	No. of questions	Weight
(i) Risk identification/assessment, damage assumption	99	77	86	68
(ii) Damage mitigation/prevention	69	46	73	47
(iii) Organization	160	133	165	136
(iv) Communication	78	66	78	66
(v) Maintenance/management of supplies and stocks	28	28	29	29
(vi) Activity planning	202	165	246	203
(vii) Information sharing with communities	36	24	36	24
(viii) Education/training	82	76	90	84
(ix) Evaluation/review	18	18	18	18
Total	772	633	821	675

*Source:* Fire and Disaster Management Agency, Ministry of Internal Affairs and Communications, “Result of Self-evaluation on Prefectural Disaster Preparedness and Crisis Management Capacity.”

capacity vs. non-structural capacity, and routine capacity vs. contingency capacity.

Most of the techniques to evaluate corporate disaster preparedness simply add up points scored on each item in a checklist or questionnaire, whereas the CMP method assigns different weights to individual indicators.

### 1.3. Techniques Regarding Local Disaster Reduction Capacity

- (i) Fire and Disaster Management Agency “Guideline for the Evaluation of Disaster Preparedness and Crisis Management Capacity of Local Governments”

#### Outline

This Guideline was designed for impartial evaluation of disaster reduction and crisis management systems to enhance the disaster preparedness and crisis management capacity of local governments. Modeled primarily on the FEMA indicator, the Guideline enables evaluation and analysis by providing a questionnaire checklist on disaster reduction to be answered by local government and presenting the results as a multidimensional chart.

The Guideline covers all prefectures as well as municipalities with large populations. Questions encompass various disasters including earthquakes, floods, windstorms, volcanic eruptions,

hazardous materials, nuclear power and terrorism.

#### Evaluation headings

Evaluation is made on nine indicators concerning risk identification and assessment (one indicator), damage mitigation and prevention, organization and planning (seven indicators) and evaluation and review (one indicator).

Taking account of specific local conditions, evaluation can be made by disaster, by stage (minimum measures to be taken regardless of the characteristics of local communities and risks involved, measures to be taken in high-risk areas, measures to ensure more effective and sophisticated disaster reduction), or by objective (life-saving, prevention of severe disruption to livelihood, disaster damage control).

#### Weights

The nine indicators are weighted as follows. In presenting the values of individual indicators in a chart, they are converted into percentage points as the indicators have different numbers of questions and weights.

The table below shows the results of evaluations made by the prefectural governments. The prefectures in Group A, located in the enhanced Tokai earthquake preparedness region, receive a higher rating than the other groups, as necessary measures have been taken in the 25 years since

**Table 4-3. Result of Local Government Evaluations**

The 47 prefectures are classified into the following three groups. The table compares the averages of the three groups for each of the nine indicators and for the overall score.

- Group A : Eight prefectures designated as enhanced Tokai earthquake preparedness region:  
Tokyo, Kanagawa, Shizuoka, Yamanashi, Nagano, Gifu, Aichi and Mie
- Group B : 15 of the 21 prefectures designated as enhanced Tonankai/Nankai earthquake preparedness region, excluding the 6 prefectures that are also included in the enhanced Tokai earthquake preparedness area:  
Shiga, Kyoto, Osaka, Hyogo, Nara, Wakayama, Okayama, Hiroshima, Yamaguchi, Tokushima, Kagawa, Aichi, Kochi, Oita, Miyazaki
- Group C : Other 24 prefectures not included in any enhanced earthquake preparedness region.

	A	B	C	National average
Overall evaluation	51.1	41.1	42.6	43.5
(i) Risk identification/damage assumption	43.1	27.7	27.1	30.0
(ii) Damage mitigation/prevention	55.3	34.4	38.4	40.0
(iii) Organization	60.7	52.4	52.0	53.6
(iv) Communication	72.2	67.5	67.9	68.5
(v) Maintenance/management of supplies and stocks	56.3	46.6	50.5	50.2
(vi) Activity planning	59.9	55.4	62.1	59.6
(vii) Information sharing with communities	42.1	29.9	28.0	31.0
(viii) Education/training	38.4	33.6	34.8	35.0
(ix) Evaluation/review	31.6	22.5	22.2	23.9

*Source:* Fire and Disaster Management Agency, Ministry of Internal Affairs and Communications, “Result of Self-evaluation on Prefectural Disaster Preparedness and Crisis Management Capacity.”

the promulgation of the Law on Special Measures against Large-scale Earthquakes. In contrast, the prefectures in the enhanced Tonankai/Nankai earthquake preparedness region have an even lower rating as a whole than the other prefectures classified in Group C, mainly because the region was only designated in 2001. Nonetheless, the result for Group A indicates that the designation as an enhanced earthquake preparedness region is accelerating the adoption of disaster reduction measures.

(ii) Shizuoka Prefecture “Survey on Municipal Disaster Preparedness”

Local disaster preparedness is determined by examining the measures to be undertaken by the municipalities according to their community disaster preparedness plans. Answers to the 125 questions on a scale of 1 to 4 are quantified to produce the overall score. The level of achieve-

ment is measured against the case of 100% implementation of all necessary measures.

(iii) Cabinet Office “Survey on the Establishment of Techniques for Evaluating Community Disaster Preparedness”

The survey identifies the disaster preparedness of local residents and communities. Community preparedness against landslide disasters is classified into six categories (early warning and monitoring capacity; capacity to decide on voluntary evacuation; communication capacity; escape guiding capacity; organization for disaster reduction; and landslide risk detection). Different weights are assigned to individual questions. The level of achievement is measured against perfect disaster preparedness (= 100).

The disaster preparedness indicators mentioned above may be summarized as shown in Table 4-4.

**Table 4-4. Comparison of Disaster Preparedness Indicators**

Evaluation indicator	Covered risks	Evaluated entities	Evaluation items	No. of questions
Tokio Marine & Nichido Risk Consulting “Crisis Management Regime Diagnosis System”	Overall	Businesses	Evaluation is made on the following nine items to identify strengths and weaknesses of crisis management regime: (i) top management, (ii) organization, (iii) crisis management process, (iv) implementation, evaluation and correction of crisis management program, (v) development of organizational capacity/human resources, (vi) information processing in crisis situations, (vii) management records, (viii) emergency regime and planning, and (ix) recovery planning	60
FEMA (Federal Emergency Management Agency) Guideline	Emphasis on earthquakes	Local governments and businesses	Checklist method: (i) planning components, (ii) burden sharing, (iii) emergency response, (iv) business recovery, and (v) earthquake preparedness	–
BAREPP (Bay Area Earthquake Preparedness Project) guideline	Emphasis on earthquakes	Businesses	Checklist method: (i) disaster prevention and mitigation, (ii) occurrence of a disaster, and (iii) rapid restoration	–
Study Group on the Improvement of Corporate Disaster Preparedness in the Gakunan Area “Check Sheet for the Improvement of Corporate Disaster Preparedness in the Gakunan Area”	Emphasis on earthquakes	Businesses (establishments)	Evaluation on a scale of 0-3 on the following items: (i) comprehensive measures, (ii) damage mitigation measures, (iii) preparedness for emergency response, (iv) preparedness for business continuity and recovery, (v) contribution to disaster prevention in the community, and (vi) universal design for disaster reduction	Manufacturing 47 Commerce 49
Prof. Kaji (Keio Univ.) and Mr. Yamamoto (Koito Manufacturing) “CMP method”	Emphasis on earthquakes	Businesses	Evaluation based on the following 12 indicators as well as the composite “overall disaster preparedness indicator.” Stock capacity: (i) quakeproof stock capacity, (ii) fireproof stock capacity, (iii) information capacity, and (iv) supply preparation Manpower: (i) disaster preparedness training, (ii) disaster preparedness education, (iii) in-house fire-fighting team, and (iv) management awareness Planning capacity: (i) rapid reaction, (ii) planning contents, (iii) information system, and (iv) preparedness	34
Fire and Disaster Management Agency “Guideline for the Evaluation of Disaster Preparedness and Crisis Management Capacity of Local Governments”	Disaster risk	Prefectures Municipalities	Evaluation on total scores obtained in answering questions concerning: (i) risk identification/assessment, damage assumption, (ii) damage mitigation/prevention, (iii) organization, (iv) communication, (v) maintenance and management of supplies and stocks, (vi) activity planning, (vii) information sharing with communities, (viii) education/training, and (ix) evaluation/review	Prefectures 772 Municipalities 821
Shizuoka Prefecture “Survey on Municipal Disaster Preparedness”	Disaster risk	Municipalities	Answers to questions regarding the following issues on a scale of 1 to 4 are quantified to evaluate disaster preparedness: (i) disaster countermeasures office, (ii) information/communication activities, (iii) emergency transport activities, (iv) voluntary disaster prevention activities, (v) evacuation activities, (vi) medical relief activities, (vii) emergency supplies, and (viii) emergency relief activities	125
Cabinet Office “Survey on the Establishment of Techniques for Evaluating Community Disaster Preparedness”	Landslide disasters	Communities	Evaluation based on the level of achievement against perfect disaster preparedness (= 100), with different weights assigned to individual questions regarding: (i) early warning/monitoring, (ii) capacity to decide on voluntary evacuation, (iii) communication capacity, (iv) escape guiding capacity, (v) organization for disaster reduction, and (vi) landslide risk detection.	29

Sources: Fire and Disaster Management Agency, Cabinet Office, “Survey Report on the Establishment of Guideline for the Evaluation of Prefectural Disaster Preparedness and Crisis Management Capacity;” Research Report for the Improvement of Corporate Disaster Preparedness in the Gakunan Area.

## 2. Ideas on Disaster Rating

Comprehensive corporate efforts for disaster reduction (disaster management) including BCPs must be evaluated properly in order to encourage further efforts. In addition to developing comprehensive indicators, disaster rating may also be ensured by incorporating disaster-related factors into the indicators used for environmental or CSR ratings.

Taking into account the evaluation techniques outlined in the previous section, this section outlines some ideas regarding the introduction of a disaster rating system in the future.

### 2.1. Forming a Social Consensus

Environmental measures are likely to be accepted within a company, as they will help reduce costs through energy conservation and avoid legal risk by complying with environmental quality standards. Although disaster reduction efforts are crucial for saving the lives of employees, measures that incur costs to cover a highly uncertain risk will not be popular. Introduction of disaster rating will be difficult without a social consensus that supports corporate efforts for disaster reduction and their evaluation.

### 2.2. Divergence between Indicators and Actual Conditions

Priorities in disaster reduction vary among industries and with size of corporation. Of course, saving the lives of employees and customers should be the top priority, but the second and third priorities should be determined by individual companies. If evaluation techniques are too uniform, they may not be able to reflect the actual conditions of disaster reduction efforts in individual companies. Likewise, the level of a disaster preparedness plan cannot be identified by simply asking whether such a plan exists. Thus, disaster indicators must reflect the actual status of corporate efforts.

### 2.3. Evaluation of Active Disaster Reduction Efforts

Indicators to evaluate disaster reduction efforts need to combine negative screening for minimum measures with positive screening for active

corporate efforts including community disaster reduction agreements. A credit association in Fuji has installed a plug outlet connected to a private power generator outside the office, which can be used in case of emergency. If such active investment is positively evaluated, it will encourage corporate efforts for disaster reduction.

### 2.4. Consistency of Different Indicators

Appropriate weights should be assigned to different aspects of corporate efforts, such as life saving and profit protection. It is crucial to ensure that the weighting of individual items is consistent with the overall evaluation of corporate efforts.

## 3. Disaster Rating Indicator

### 3.1. Framework of Evaluation Measures

In light of the ideas outlined in the previous section, an evaluation measure may be developed to see whether a PDCA cycle is functioning at each of the chronological stages: prevention, emergency and recovery (Table 4-5). Some components of this indicator are common to all stages, including compliance and cooperation with the local community, development of products and services for disaster reduction, and disclosure of disaster information. The indicator makes it possible not only to evaluate corporate disaster reduction efforts (disaster management) in a holistic manner but also to monitor progress at each chronological stage. The questionnaire will contain qualitative questions asking whether certain efforts are being made, as well as quantitative ones asking about the ratio of quake-resistant buildings, the objective regarding recovery time and the level of achievement against identified goals.

### 3.2. Major Considerations in the Indicator

The disaster rating indicator includes the following considerations:

- (i) Confirmation of top management's commitment;
- (ii) Issues related to computerization and cooperation with the local community, whose importance was reconfirmed by Japan's experience in major disasters in the past, including the Great Hanshin-Awaji Earthquake;

**Table 4-5. Disaster Rating Indicator**

	Preventive measures (disaster mitigation): minimize damages		Emergency measures (crisis management): evacuation, safety confirmation and life-saving		Recovery measures: business continuity and early restoration	
	Example of components		Example of components		Example of components	
Plan	Policy	Do you have a company-wide policy for disaster reduction?	Policy	Do you have a clear policy for action in case of a disaster?	Policy	Do you have a clear policy for business continuity or rapid recovery?
	Objective	Do you have clear objectives for disaster reduction?	Objective	Do you have clear objectives for evacuation, safety confirmation and life-saving measures?	Objective	Do you have clear objectives for business continuity and recovery (e.g. number of days required for recovery)?
	Planning	Do you have a medium- or long-term plan for efficient implementation of disaster reduction measures?	Planning	Do you have a concrete plan for evacuation, safety confirmation and life-saving measures?	Planning	Have you prepared a BCP (business continuity plan)?
	Manual	Do you have a comprehensive manual for disaster reduction?	Manual	Do you have a manual setting forth actions to be taken to ensure evacuation?	Manual	Have you set forth in a manual the procedures to ensure business continuity and recovery?
	Organization	Do you have a section in charge of disaster reduction?	Organization	Have you defined in advance the composition of a "disaster countermeasures office"?	Organization	Have you established a cross-divisional committee on business continuity?
	Management commitment	Is your top management clearly committed to disaster reduction efforts?				
Do	Risk assumption	Have you prepared multiple scenarios?	Evacuation	Have you designated a section responsible for evacuation?	Risk identification	Have you made an assumption on the chronological development of earthquake damages and response measures (scenario assumption)?
	Disaster reduction investment	Do you identify the amount of investment in disaster reduction for each business year (disaster accounting)?	Medical relief	Have you prepared a list of hospitals nearby?	Damage identification	Do you have any concrete measures for identifying casualties and property damages affecting business continuity after a disaster?
	Promotion of quake resistance	Do you have any concrete measures for improving quake resistance?	Safety	Do your employees know how to confirm safety?	Installation of substitute equipment	Have you secured an appropriate backup office or substitute production facilities?
	Promotion of fire resistance	Do you have any concrete measures for improving fire resistance?	Preparation of disaster reduction supplies	Are disaster reduction supplies properly distributed?	Supply chains	Do you consider business continuity of prospective partners before entering into transactions?
					Risk financing	Have you secured risk financing through earthquake insurance, CAT bonds or loan commitments, for example?
Check	Audit	Do you have your disaster reduction measures evaluated by an independent third party?	Audit	Do your evacuation drills involve administrative organizations including fire department or other experts?	Audit	Do you have your business continuity management evaluated by an independent third party?
	Education	Do you provide all employees with education on basic matters regarding disasters (earthquake damages, recent disasters, etc.)?	Training	Do you conduct an evacuation drill at least twice a year (1/2 if it is conducted only once a year)?	Training	Do you conduct any simulation to ensure smooth business continuity in emergency situations?
	Progress in quake resistance improvement	Have you ensured that all of your business establishments are resistant to earthquakes of up to 7 on the Japanese intensity scale? Rating according to the level of quake resistance (1/2 if more than half of the establishments are quake resistant).	Education	Do you hold lectures to learn basic facts about evacuation, safety confirmation and relief?	Education	Do you hold training sessions on business continuity?
	Progress in fire resistance	Are all of your business establishments fire resistant (1/2 if more than half of the establishments are fire resistant)?				
Action	Review	Are evaluations by a third party properly reflected in your plans or manuals?	Review	Do you review evacuation routes, disaster reduction supplies and manuals from time to time to correct any inadequacy?	Review	Are evaluations by a third party properly reflected in your plans or manuals?

Common components	Compliance	Have you committed any serious violations of law in the last three years?
	Community	Have you concluded any support agreement with national or local governments to open up your facilities to evacuees or to provide food, water or other necessary supplies?
	Disaster reduction products	Have the sales of products or services for disaster reduction increased on the previous year?
	Disclosure	Have you properly disclosed information on disaster reduction measures taken in your company?

Component	Score
Preventive measures (disaster mitigation)	
Emergency measures (crisis management)	
Recovery measures	
Common components	
Total	

Source: DBJ.

- (iii) Evaluation from the viewpoint of business continuity, an emerging requirement for companies; and
- (iv) Confirmation that commitment to disaster reduction is not a mere formality, but supported by the consideration of multiple scenarios, for example.

#### 4. New Methods of Business Evaluation

Intangible assets now account for almost 40% of the total market value of Japanese companies.<sup>21</sup> In addition to intellectual property in a narrow sense, including patents, intangible assets have a wide variety of components such as human capital, organizational capital including the manage-

**Table 4-6. Reports and Accounting for Business Evaluation**

Disclosure method	Sustainability report	CSR report	Intellectual property report	Financial report	Social environmental report	Intellectual capital report
Accounting	Environmental accounting	CSR accounting	Intellectual property accounting	Financial accounting	Disaster accounting	Intellectual capital (accounting)
Objective	Promote environmental communication, ensure accountability for environmental conservation efforts in business activities and provide stakeholders with useful information.	Improve CSR by clarifying how the economic benefits of corporate activities are distributed among stakeholders.	Facilitate dialogue between markets and companies involved in intellectual property management.	Maximize returns through business risk management, based on the understanding that risk management represents a comprehensive activity to create business value.	Improve corporate disaster preparedness by clearly presenting efforts for disaster reduction and their effect.	Explain and develop the sources and management of corporate intellectual capital.
Contents	Overview of policies, objectives and achievements related to environmental considerations in business activities; current conditions of environmental management; current status of environmental impact of business activities and efforts for its reduction; current status of social measures.	Quantify the cost and effect of various corporate activities to contribute to society. Include social contribution such as welfare activities and compliance.	10 components including: (i) core technology and business model; (ii) orientation of R&D segment business strategy; (iii) outline of R&D segment and intellectual property; and (iv) analysis on the marketability and market advantage of technology.	Disclose major risks in financial report.	Compare investment in disaster reduction (quake resistance improvement, BCP, cost of disaster preparedness training) with the effect of loss mitigation through disaster reduction measures.	How to accumulate and develop existing intellectual capital in employees, customers, technologies, processes, and the relations among them.
Strategic aspect	Awareness-raising of management and employees; functions to promote action; advertising of corporate attitude toward environmental conservation.	Improve corporate image by highlighting CSR efforts. Also used as a strategy to ensure stable growth.	Drive home the growth potential of the company from the viewpoint of intellectual property.	Improve corporate value by appropriate risk management and internal control.	Improve corporate value by highlighting the company's efforts for disaster reduction.	Improve corporate value by recognizing intellectual capital as the source of corporate value.
Current status	Adopted by 34% of listed Japanese companies.	CSR report adopted by dozens of Japanese companies. CSR accounting introduced by Ito-Yokado, Mitsui Sumitomo Insurance, etc.	Adopted by 13 companies participating in the METI study group (Tokyo Electron, Asahi Kasei, NEC, etc.).	Disclosure of enterprise and other risks is required in financial reports published on 1 April 2003 or later.	Several companies including Sekisui Chemical describe disaster reduction efforts.	Codified in Denmark. Codification under consideration in U.K. and Finland.

Sources: Environmental Accounting Guidelines; White Paper on International Economy and Trade 2004; METI Reference Guideline for Intellectual Property Information Disclosure.

<sup>21</sup> White Paper on International Economy and Trade 2004.

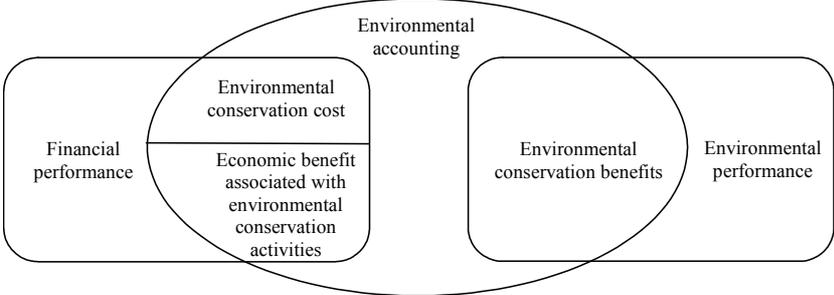
ment of organizations, and the network of business partners. Proper disclosure of the company value that is not presented on the balance sheet will be important for the company itself, as well as for a wide range of stakeholders. For this reason, corporate management and its evaluation, which relied primarily on financial indicators, have been approached in recent years from various viewpoints including CSR, risk management and intellectual capital (Table 4-6). This section describes some of the emerging methods of business evaluation.

**4.1. Environmental Accounting**

The objective of environmental accounting is to achieve sustainable development, maintain a favorable relationship with the community, and pursue effective and efficient environmental conservation activities. These accounting proce-

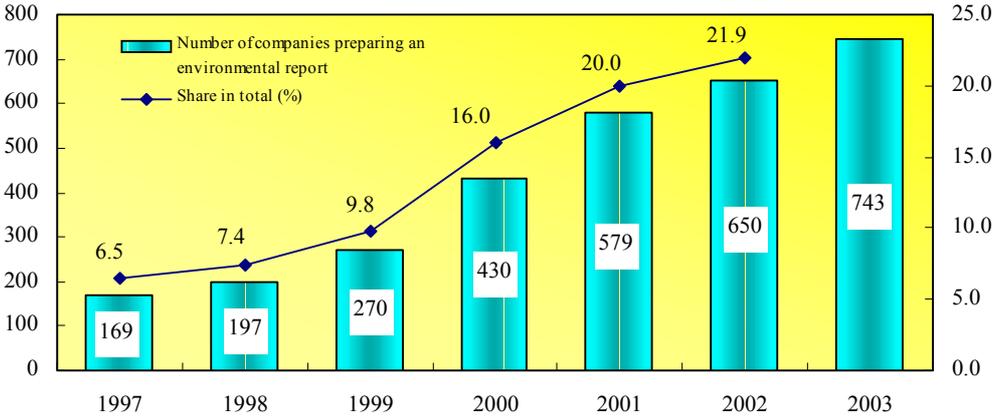
dures allow a company to identify the cost of environmental conservation during the normal course of business, identify benefit gained from such activities, provide the best possible means of quantitative measurement (in monetary value or physical units) and support the communication of its results (Environmental Accounting Guidelines 2002). Environmental accounting is composed of environmental conservation cost (monetary value), environmental conservation benefits (physical units), and the economic benefit associated with environmental conservation activities (monetary value).

An increasing number of companies use environmental accounting to prepare and publish an environmental report (Figure 4-4). 34% of listed companies prepared such a report in fiscal 2002.



Source: Environmental Accounting Guidelines.

**Figure 4-3. Outline of Environmental Accounting**



Sources: Ministry of the Environment, "Survey on Environmentally Sound Corporate Behavior FY2002," etc.

**Figure 4-4. Number of Companies Preparing an Environmental Report**

## 4.2. CSR Accounting

CSR accounting quantifies the costs and effects associated with various social contribution activities undertaken by companies. It covers ethical/compliance and environmental conservation activities, as well as social contribution activities including donations. Their effects include both internal effects that bring direct benefits to the company and external effects that benefit society as a whole. CSR accounting has been published by companies such as Mitsui Sumitomo Insurance and Ito-Yokado.

## 4.3. Disclosure of Risk Information

The fiscal 2003 revision to the Securities Exchange Law expanded the scope of disclosure. Thus, enhanced disclosure is now required on matters related to corporate governance, analysis

of financial/managerial performance by management, and matters associated with risks. Many companies include earthquake and other disaster risks in their risk information disclosure (Table 4-7). The description of risk by Tomoegawa Paper is shown below as an example. Starting in the current fiscal year, companies are required to take measures against the disclosed risks. Preparation of BCP or risk financing is one possible response to the disclosed risks.

## 4.4. Intellectual Capital

Various approaches to intellectual capital have been developed by companies and researchers since Scandia (Sweden) introduced an intellectual capital report. Preparation of intellectual capital reports has been encouraged at the national level in recent years, particularly in Nordic

**Table 4-7. Disclosure of Business-related Risks**

Risk heading	Number of disclosing companies
Foreign exchange and interest risks	54
Disaster risk	40
Impact of economic fluctuations	40
Risks involved in expanding business abroad	38
Fluctuations in raw material prices	32
Legal risk	31
⋮	⋮
Information system	24
Total number of companies covered by the analysis	68

Source: Sampo Japan Risk Management, "Major Disasters and Business Continuity Management."

### **Tomoegawa Paper Co., Ltd.**

#### Impact of Tokai earthquake

Production facilities of our group are located in the City of Shizuoka, Shizuoka Prefecture. Depending on its scale, a Tokai earthquake might have a serious impact on production and sales activities for a substantial period of time. In light of this risk, the Company has taken the following countermeasures.

- (1) We asked relevant experts to measure the quake resistance of production facilities and equipment. Based on the results, we have completed necessary works to reinforce the buildings against earthquakes.
- (2) We have production facilities in Ibaraki Prefecture (electronic material business) and North America (chemical and foreign paper businesses) to diversify risks.
- (3) We have ensured risk financing primarily through earthquake insurance.

Source: Tomoegawa Paper financial report.

countries including Denmark and Finland.<sup>22</sup> The sources of corporate value may be classified into the upstream area including human and organizational resources, the midstream area including management, and the downstream area that produces ultimate benefits. Most of the descriptions in financial reports only refer to the downstream area, i.e. final results. In the future, explanations will need to cover the upstream and midstream areas, which are highlighted by intellectual capital reports. As corporate value cannot be explained by financial indicators alone, intellectual capital reporting is expected to assume a new role in expressing corporate value appropriately.

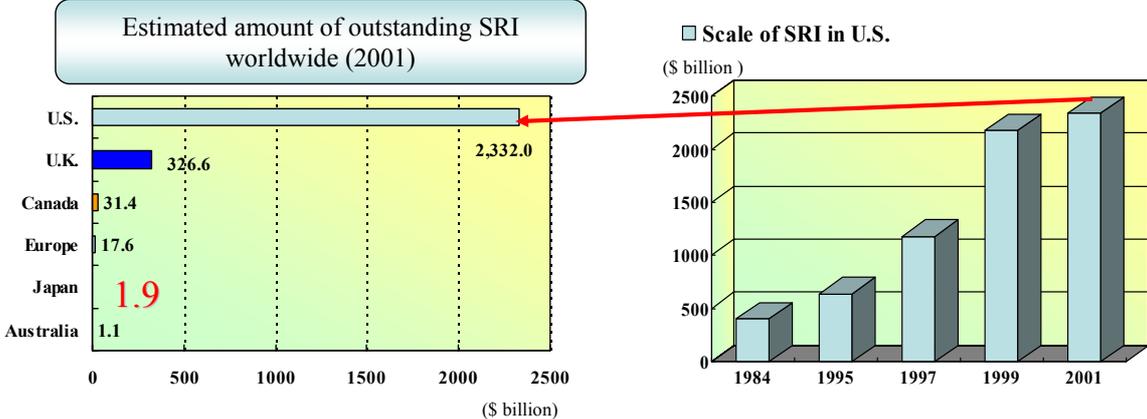
Looking ahead, the various approaches to business evaluation outlined in this section, including intellectual capital accounting, will not only become more sophisticated but also interact with each other.

**5. Development of SRI for Disaster Reduction**

As discussion heats up on corporate social responsibility, the significance of efforts for disaster reduction needs to be clearly understood in conjunction with the triple bottom-lines of the economy, environment and society.

Socially responsible investment (SRI) seeks to meet this requirement of corporate social responsibility by incorporating social and environmental factors in the assessment of investment content, in addition to the traditional financial factors. As shown in Figure 4-5, SRI has developed rapidly since the late 1990s, when Anglo-American pension funds and insurers began to embrace socially responsible investment behavior.

Starting in the field of the environment, SRI in Japan has expanded to social areas (Table 4-8). Although it remains far below the level of Europe and the U.S. in terms of scale, Japanese SRI is expected to increase in the years ahead as interest in corporate social responsibility grows. In this context, introduction of SRI for disaster reduction will have to be considered, in order to assess corporate management in terms of disaster resilience, as well as environmental soundness and social efforts. Various forms of SRI will be developed in the future. Most importantly, however, Japanese companies will be able to erase their concerns about the future risks of earthquakes and other natural disasters by advocating the adoption of disaster reduction SRI as a global standard.



Sources: Social Investment Forum, etc.

**Figure 4-5. Scale of SRI Market**

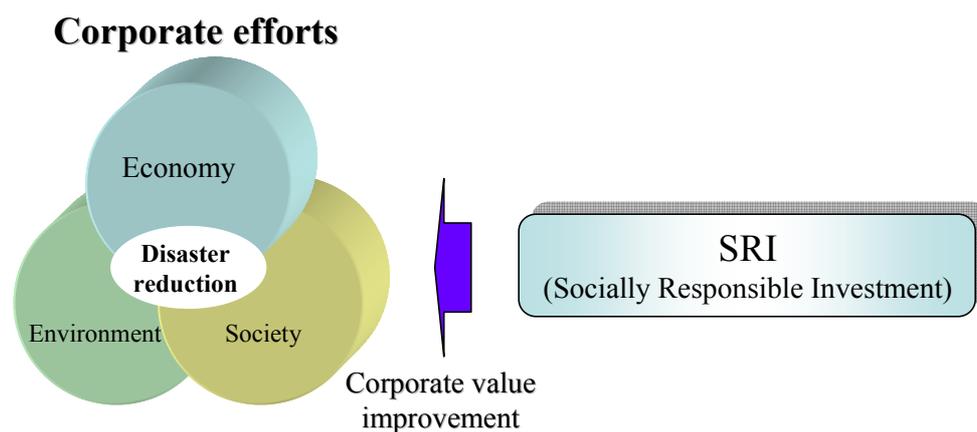
<sup>22</sup> Denmark has codified the disclosure of intellectual capital in a report.

**Table 4-8. List of SRI Funds in Japan**

Investment firm	Name	Classification	Date of creation	Social/environmental screen	Net assets (¥ million)
Nikko Asset Management	Nikko Eco-Fund	Domestic	20/8/1999	Environment	37,077
Sompo Japan Asset Management	Eco-Fund "Buna no Mori"	Domestic	30/9/1999	Environment	12,629
Kogin-Daiichi Life Asset Management	Eco-Fund	Domestic	29/10/1999	Environment	5,046
UBS Global Asset Management	UBS Japanese Stock Eco-Fund (Eco Hakase)	Domestic	29/10/1999	Environment	3,924
UFJ Partners Investment Trust	Eco Partners (Midori no Tsubasa)	Domestic	28/1/2000	Environment	2,596
Asahi Life Asset Management	SRI Social Contribution Fund (Asu no Hane)	Domestic	28/9/2000	Environment, employment, consumer interest, social contribution	4,116
Mitsui-Sumitomo Asset Management	Eco Balance (Umi to Sora)	Balance	31/10/2000	Environment (global warming)	1,089
Nikko Asset Management	Global Sustainability Fund (Nikko Globe A)	International	17/11/2000	Economy, society, environment	1,121
Nikko Asset Management	Global Sustainability Fund (Nikko Globe B)	International	17/11/2000	Economy, society, environment	701
Daiwa-Sumigin Investment Trust & Investment Management	Global Eco Growth Fund (Mrs. Green A)	International	15/6/2001	Environment	1,642
Daiwa-Sumigin Investment Trust & Investment Management	Global Eco Growth Fund (Mrs. Green B)	International	15/6/2001	Environment	2,574
UBS Global Asset Management	UBS Global 40	International	7/11/2003	Society, environment, economy	6,044
Sumitomo Trust Asset Management	Good Company	Domestic	26/12/2003	Society, environment, economy	21,253
Shinkin Asset Management	Fukoku SRI Fund	Domestic	27/4/2004	Finance, environment, society, ethics	2,857
Daiwa Asset Management	Daiwa SRI Fund	Domestic	20/5/2004	Ethics, compliance	27,564
Nomura Asset Management	Nomura Global SRI 100	International	28/5/2004	Society, environment, economy	4,739
Nomura Asset Management	Morningstar SRI Index Open	Domestic	39/7/2004	Society, environment, economy	3,426
Mitsubishi Asset Management	Mitsubishi SRI Fund	Domestic	3/12/2004	Employment (family-friendliness)	1,537
					139,935

*Note:* Net asset figures are as at the end of January 2005.

*Source:* Daiwa Institute of Research.



*Source:* DBJ.

**Figure 4-6. Development of SRI for Disaster Management**

## Conclusion

In January 2005, the tenth anniversary of the Great Hanshin-Awaji Earthquake was marked by the United Nations World Conference on Disaster Reduction, which was held in Kobe with the participation of 168 delegations and 78 international organizations. The Conference reiterated the importance of disaster reduction by adopting a Hyogo Framework for Action, which includes five “priorities for action” to be addressed in the coming ten years including the development of early warning systems for natural disasters.

An appropriate mix of self-help, mutual aid and public assistance is essential if we are to prepare for major disasters including earthquakes. Among the three elements, self-help, particularly

the role of businesses, has become increasingly important. Corporate disaster preparedness is expected to improve substantially, boosted by legal obligations and voluntary efforts by businesses. The development of BCPs and SRI (socially responsible investment) for disaster reduction will be one of the major challenges in encouraging voluntary and strategic corporate efforts.

Active discussion on corporate social responsibility indicates that disaster reduction, as well as environmental conservation, must be considered within its framework. Looking ahead, efforts for disaster reduction will become a major factor in improving corporate value, as they have a substantial impact on corporate management in the long term.

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